BULLETIN 146

ILLUSTRATED FLORA OF THE CANADIAN ARCTIC ARCHIPELAGO

BY

A. E. PORSILD

1957

NATIONAL MUSEUM OF CANADA
DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

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DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

NATIONAL MUSEUM OF CANADA

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BY
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Illustrations
BY
Dagny Tande Lid

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ILLUSTRATED FLORA OF THE CANADIAN ARCTIC ARCHIPELAGO

INTRODUCTION

The present work is intended as a guide or manual to the 340 species and major geographical races of flowering plants and ferns that comprise the vascular flora as it is known at present of the Canadian Arctic Archipelago[1]. Besides conventional keys to families, genera, and species, it contains brief descriptions, line drawings, and maps showing the North American ranges of all species. For each species brief notes are given on local occurrence, soil preferences, economic uses, if any, and on their total or world distribution. A glossary explains the meaning of all special botanical terms used throughout the text; at the end an index is provided to species, illustrations, and maps.

Those requiring fuller and more detailed information on local plant distribution, ecology, or taxonomy in the Western Archipelago should consult "Vascular Plants of the Western Canadian Arctic Archipelago" by the writer (Nat. Mus. Canada, Bull. 135, 1955). In the introduction of that work a somewhat detailed account of the topography is given, together with a discussion of other physiographic features affecting plant cover and distribution; a description of the principal plant communities and plant habitats; a statistical analysis of the distribution of species from which certain deductions are made regarding the probable age and affinity of the flora; and, finally, an account of the history of botanical exploration in the Archipelago. The systematic part comprises the main body of the work. There, for each of 234 species recorded from the western islands, are given pertinent references to literature together with detailed information on local and general distribution, as well as on ecology. In the case of rare or critical species a detailed discussion of their taxonomy and morphology is generally given. On pages 191 to 193 of Bulletin 135 are cited the principal publications dealing with the flora of the Canadian Arctic Archipelago.

Similarly, the reader desiring more detailed information of the flora of the Eastern Canadian Arctic may refer to N. Polunin's "Botany of the Eastern Canadian Arctic", Part I of which (Nat. Mus. Canada, Bull. 92, 1940) deals with the vascular flora; Part II (Nat. Mus. Canada, Bull. 97, 1947) with mosses, lichens, and algae; and Part III (Nat. Mus. Canada, Bull. 104, 1948) with vegetation and ecology. Recent collections of plants from the eastern islands have added materially to the 246 species of vascular plants reported by Polunin from the eastern arctic islands. The more important of these recent collections are in the National Herbarium of Canada and, together with a few published additions to the flora, have been incorporated in the distribution maps at the end of the present work.

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[1] Descriptions as well as range and habitat notes (in small print) have been inserted in the text for some 40-odd species that as yet have not been recorded in the flora of the Archipelago but that, for phytogeographic reasons, may be expected to turn up in parts so far incompletely explored.

The plant material upon which "Flora of the Canadian Arctic Archipelago" (as well as Bulletins 92 and 135) is based consists mainly of the collections preserved in the National Herbarium of Canada at Ottawa. In addition, the arctic collections of a number of other herbaria have been consulted. The principal ones in which are found significant material from the Canadian Arctic Archipelago are those in the herbaria of the Royal Botanic Gardens at Kew and the British Museum (Natural History), London, England; the Botanical Museum of the University of Copenhagen, Denmark; the Natural History Museum of Stockholm, Sweden; the Botanical Museum of the University of Oslo, Norway; the Gray Herbarium of Harvard University, Cambridge, Mass.; the herbarium of the New York Botanical Garden, New York City; and the United States National Herbarium, Washington, D.C. The writer wishes to express his sincere appreciation to the directors and curators of these herbaria for making the arctic collections under their care available for study. The examination of a number of critical specimens as well as letters and unpublished records in European herbaria was made possible, in part, by a grant from the Penrose Fund of the American Philosophical Society.

Grateful acknowledgment is due to Professor Thorvald Sørensen of the University of Copenhagen who undertook to prepare the keys and descriptions of species in the genus *Puccinellia;* and to Professor Tyge W. Böcher of the same institution, who with the author checked the distribution maps in regard to the ranges shown for East and Northwest Greenland plants.

The writer further wishes to thank all those who from time to time have contributed collections of plants to the National Herbarium of Canada from the Arctic Archipelago. Many of these collections are from places that have never been visited by professional botanists. All such collections from the western islands that were known to the writer prior to 1953 are listed in Bulletin 135. Similarly, Polunin, in Bulletins 92 and 97, has listed collections known to him from the eastern islands, prior to 1940. Since the publication of these reports, a number of important collections of plants have been made, chiefly in the Eastern Arctic; the more significant of these unreported collections are listed below.

Eastern Arctic: Ellesmere Island. North coast, J. P. Kelsall, Can. Wildlife Service (1948); S. D. MacDonald, National Museum (1951); P. F. Bruggemann (1951); Hattersley-Smith, Ottawa (1954); R. L. Christie, Geol. Surv. Canada (1954). West coast, J. S. Tener, Can. Wildlife Service (1951); J. C. Troelsen, Copenhagen (1952); P. F. Bruggemann, Ottawa (1953-54); S. D. MacDonald, National Museum (1955).

Baffin Island: Shores of Foxe Basin, T. H. and E. M. Manning, Ottawa (1938–40); Lake Amadjuak Region, J. Carrol, Topogr. Service (1943); Frobisher Bay Region, V. C. Wynne-Edwards, McGill University (1937 and 1953); C. Thacker, National Museum (1948). Cape Searle and head of River Clyde, V. C. Wynne-Edwards (1950), University of Aberdeen.

Western Arctic: In 1954 and again in 1955, Mrs. Paul F. Cooper of Cooperstown, N.Y., made important collections in King William Island and at Spence Bay on the west coast of Boothia Peninsula, adding no less than 24 species to those previously known from King William Island.

In 1954 E. H. McEwen, Canadian Wildlife Service, made a small collection of plants from the vicinity of Cape Kellett on the west coast of Banks Island; one species not previously known from that island, or indeed from the western Archipelago, was added. In 1955, S. D. MacDonald, National Museum, collected a few plants on the northwest coast of Axel Heiberg Island. Since the publication of Bulletin 135, I have examined a collection of plants from Prince Patrick Island, made in 1952 by Mr. P. F. Bruggemann. This collection contains the following 11 species not recorded from that island in Bulletin 135: *Lycopodium Selago, Deschampsia brevifolia, D. pumila, Poa arctica* ssp. *caespitans, Festuca brachyphylla, Carex misandra, Stellaria humifusa, Sagina intermedia, Ranunculus Gmelini, Senecio congestus,* and *Crepis nana.*

The writer finally wishes to thank Mrs. Dagny T. Lid of Oslo, Norway, who has contributed all but seven of the line drawings reproduced in the text. Mrs. Lid's skill and knowledge of many of these plants is reflected in the excellence of her drawings. The remaining seven drawings: fig. 31, h, i; fig. 40, d, e; fig. 42, h; fig. 56, f; fig. 59, d were prepared by Mr. John Crosby of the staff of National Museums of Canada.

Physiography

For the purpose of floristic treatment, the Canadian Arctic may be defined as comprising all land surfaces lying north of the tree-line, which, broadly speaking, follows the 50° F. (10° C.) isotherm for the warmest month of the year. In the delta of the Mackenzie, this line, in latitude 68°40′, almost reaches the shores of the Arctic Ocean, but farther east, because of the cooling influence of Hudson Bay, it is sharply deflected in a southeasterly direction so that in James Bay, in approximately the same latitude as London, England, tree growth is comparable to that of the Mackenzie Delta. East of Hudson Bay the tree-line again trends northward, cutting across Ungava Peninsula from Richmond Gulf to the foot of Ungava Bay, only to become deflected southward again along the Labrador Coast, owing to the influence of the cold Labrador current.

As thus defined, the Canadian Arctic comprises approximately 900,000 square miles of land (or 2.5 million square kilometers), of which the Arctic Archipelago contributes 549,000 square miles (1.42 million square kilometers) or approximately two-thirds of the area of Greenland. From east to west the Archipelago extends from the southern tip of Baffin Island to the northwest corner of Banks Island—a distance of about 1,860 miles (3,000 km.). In a north-south direction it extends from approximate latitude 61° in Baffin Island to Cape Columbia on the north coast of Ellesmere Island, in latitude 83°39′—a distance of 1,550 miles (2,500 km.), or nearly the length of Greenland.

One of the principal topographical features of the Arctic Archipelago is the mountain range that extends in a north-south direction from Labrador across Baffin, Devon, Ellesmere, and Axel Heiberg islands. This range, which in some sections reaches elevations of 8,000 or even 10,000 feet (2,400–3,000 m.), strongly affects the climate of the rest of the Archipelago, because it acts as a mechanical barrier for the free flow of air from one side to the other. This is strikingly illustrated by the annual mean temperature, which at Bache Peninsula on the east coast of Ellesmere Island, in latitude 79°10′, is 4° F. (−15° C.); whereas at Eureka, on the west side, in latitude 80°, it is −4° F. (−20° C.). At Bache Peninsula the total annual precipitation is 5.19 inches (132 mm.), but at Eureka it is only 1.74 inches (44.2 mm.).

Two major gaps or breaks occur in this mountain range; the first in Hudson Strait, which separates Ungava-Labrador from Baffin Island; the second is Lancaster Sound, which separates that island from Devon. Both are important phytogeographical boundaries. Lancaster Sound and its westward projection through Barrow Strait, Viscount Melville Sound, and M'Clure Strait—just south of the 75th parallel—is another major topographical feature which divides the Archipelago into well-marked northern and southern parts. The southern part is divided by Boothia Peninsula into an eastern and western section. The principal topographical feature of the eastern section is Baffin Island, 178,700[1] square miles in area (or 422,000 sq. km.), and Banks and Victoria islands dominate the western section. The former is 23,230 square miles (60,000 sq.km.) in extent, and the latter with 82,000 square miles (212,000 sq. km.) is the largest of the western islands. In the northern half of the Archipelago—in recent maps named "Queen Elizabeth Islands"—Ellesmere, 81,430 square miles (215,000 sq. km.), and Devon form a natural topographic and phytogeographic northern extension of the Eastern Arctic; to the west the islands comprising the Sverdrup and the Parry groups together form a more or less natural topographic and phytogeographic unit.

The climate of the Archipelago is distinctly arctic and, with the exception of the east coast, decidedly continental in character. That there is surprisingly little difference between the summer temperature in the southern and northern parts, although the Archipelago extends over more than 20 degrees of latitude, is particularly noteworthy, and fundamentally important for the distribution and growth of plants. Thus, the highest June means are reported from Eureka (latitude 80°) and Lake Harbour (latitude 62°50′) near the northern and southern extremities of the region, with 38° F. (3.3° C.)[2] at both stations, while the lowest June mean has been recorded from Prince Patrick and Ringnes islands, at 30° F. (−1.1° C.).

During July the mean temperatures rise gradually and uniformly throughout the Archipelago, but, as in June, they vary little from station to station, except that the lowest July means are again to be found along the coasts bordering the Polar Sea, with Mould Bay, Isachsen, and Resolution Island, at the entrance to Hudson Strait, all reporting 38° F. (3.3° C.). The highest July temperatures occur on the larger islands near the mainland with 46° F. (7.8° C.) and 48° F. (8.9° C.), reported from stations in southern Baffin and Victoria islands respectively. It is possible that July means reaching 50° F. (10° C.) may exist in the interior of Victoria Island.

This uniform summer temperature is due to the cooling effect of the cold seas, largely ice-covered even in summer, which surround the islands. Warm air currents from the continent to the south are rapidly cooled by passing these ice-filled seas. One example of the cooling effect of a relatively narrow body of water is that recorded at Cambridge Bay on the south coast of Victoria Island where the highest absolute temperature was 11° F. (6.2° C.) lower than the corresponding maxima recorded at Coppermine, on the mainland south of Coronation Gulf.

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[1] *et seq.* Canada Year Book, 1954.

[2] *et seq.* Climate of Can. Arct. Archipelago. Dept. of Transport, Ottawa, 1951.

A secondary effect of the cooling influence of the cold seas is the formation of a low cloud cover during July and August which prevails over most of the Archipelago and absorbs a large part of the solar heat that otherwise would have reached the ground. Thus, Cornwallis Island during August, 1948, reported only 48 hours of sunshine out of a possible 662 hours. The detrimental effect on plant growth of this cloud cover, which throughout the Archipelago, during June, July and August, averages from 70 to 80 per cent, must be considerable.

In winter the influence of the sea has the opposite effect, because the sea, despite its ice-cover, is then much warmer than the surrounding land areas. Although the monthly mean winter temperatures are low, the absolute minima are much above those of the interior Yukon and Mackenzie districts far to the south.

The annual mean precipitation is low everywhere in the Archipelago; so low that were it not for the perpetually frozen ground (permafrost) found close to the surface, large areas in the Archipelago would be entirely without vascular plants. For the islands of the Parry group the annual precipitation averages less than 5 inches (127 mm.), and for Eureka on the west coast of Ellesmere Island only 1.74 inches (44.2 mm.). South of the Parry group precipitation increases with decreasing latitude; the annual totals range from 5 to 10 inches (127 to 254 mm.) between the 75th parallel and the Arctic Circle, whereas most of the stations in southern Baffin Island report mean annual totals in the range from 10 to 15 inches (254 to 481 mm.). Over a large part of the Archipelago, summer rainfall accounts for nearly one-half of the annual precipitation.

SOILS AND PLANT HABITATS

Throughout the Archipelago the subsoil is permanently frozen, often to great depths (permafrost). The annual thaw of the surface or active layer varies with the texture and water content; in sand and gravel the active layer may be deep, whereas in wet, peaty soil the summer thaw may penetrate only a few inches. On sloping ground, mass-wasting, in the form of soil creeps, mudflows, and other types of solifluction, is common and widespread during early summer when the thawed surface layer reaches a critical point of water saturation. On level ground where the surface soil remains saturated because the permafrost layer does not permit meltwater to escape, various forms of soil movement (congeliturbation) develop, causing a sorting of the soil into curious patterns of more or less regular stone and mud polygons. These movements result from convection currents caused by repeated thawing and freezing, and are most active under extreme arctic or alpine conditions such as are found in the northern parts of the Archipelago and at high elevations. Also, they are perhaps most prevalent in soils derived from the more rapidly weathering Palæozoic rocks. Everywhere these processes are inimical to plant growth.

Everywhere wind action affects plant growth unfavourably, not only by its cooling and drying effect in summer or winter on plant stems and foliage, but also by the mechanical abrasive effect of drifting sand, and in winter by tiny snow crystals, which at extreme low temperatures become very hard and gritty. Aeolian deposition of loess is active, especially in mountainous parts of the Archipelago where the spring run-off from ice-caps and large perennating snow fields causes the formation of large erosion fans, shallow stream beds, and floodplains from which high winds in late summer pick up fine silt. Locally, in the proximity of ice-caps, loess deposition may be so rapid that only certain species can successfully cope with it.

Thus solifluction, congeliturbation, and loess deposition are important features of the arctic landscape and everywhere have a marked effect on the plant cover; only those species whose sub-aerial parts are adaptable to soil movement or deposition can successfully colonize or persist in habitats where these processes are active. Tufted species and those with moderately developed tap-roots suffer comparatively little damage from soil movement, whereas those with extensive, creeping rhizomes or stems are particularly vulnerable.

The monotonous topography of large parts of the Arctic Archipelago and its uniformly cold, dry climate are reflected in the general appearance of the plant cover which shows little variation from place to place. This is particularly true of the western islands, whereas in the east the mountainous topography provides more local variety and more diversified plant habitats.

Closed vegetation is nowhere extensive and occurs chiefly on sheltered slopes and in depressions where a regular but not too deep snow cover is provided in winter; only in the interior of Banks and Victoria islands are extensive tundra areas found.

Two types of plant habitats, closely related to snow cover, are of considerable importance in the arctic landscape and will be mentioned frequently in the text. The first is an arctic-alpine habitat for which the ecological term "snowbed" is used. By this is meant a place where, owing to topographical features, large masses of snow accumulate each winter. The plants growing on snowbed habitats enjoy the protection afforded by the snow cover and are assured a continuing water supply from the melting snow throughout the growing season but must be adapted to an even shorter growing season than those occupying more exposed habitats. In unfavourable seasons the snowbed habitat may remain covered by snow so late that the plants growing there may not have sufficient time to ripen their fruits, or they may not even have time to flower. For this reason only certain species of plants, and especially such as are adapted to vegetative reproduction, can successfully occupy snowbed habitats.

The "snowpatch" is a more arctic plant habitat, usually a rather shallow depression in the landscape, where, owing to the prevailing wind, a snowdrift forms regularly each winter, affording protection for the plant cover beneath it. The snowdrift melts early and does not keep the habitat moist throughout the growing season. In the high-arctic landscape, plants with woody aerial stems, such as willows, ground birch, and heath, are found chiefly on snowpatch habitats. To the botanist, but also to the construction engineer or roadbuilder in the Arctic, snowbed and snowpatch plants are reliable guides to the type of snow cover to be expected in winter.

Windswept, desert-like stony barrens or clay flats, flat-topped domes, rolling hills, or extensive flat-lying terraces are common features wherever Palæozoic rocks predominate. Such habitats carry a sparse vegetation of xerophytic species of tufted habit; moreover they are commonly subject to active congeliturbation, and the species that successfully colonize them are generally confined to the depressions between polygons. Woody species, especially members of the heath family, are lacking. Four species, *Kobresia myosuroides*, *Dryas integrifolia*, *Potentilla rubricaulis*, and *Oxytropis arctica*, are ubiquitous and without doubt are the most common plants in Banks and Victoria islands.

Because of the cold climate, the short summer, and consequent low soil temperatures, arctic soils are sterile. Vegetation everywhere is sparse, dwarfed, and starved. Organic decay by bacterial action is greatly reduced; consequently nitrates, phosphates, and other salts needed by plants are deficient. Where these nutrients are present, arctic plants respond by lush and luxuriant growth. Thus, bird cliffs, animal burrows, musk-ox meadows, owl perches, and goose nesting grounds, or places near present or past human habitation, or even near animal dung or skeletal remains, are often marked from afar by lush and green vegetation, in striking contrast to the otherwise drab and grey arctic landscape. Such "enriched" local areas often harbour an interesting micro-flora, composed partly of species that are ubiquitous and partly of species that are rare and are entirely confined to these habitats. For this reason these "oases" in the arctic desert are often rewarding to the botanical collector.

Strand vegetation is feebly developed in the Arctic. On rocky shores the annual formation of an ice-foot or ice-shelf is detrimental to plant growth, as is the effect of ice-shove on shelving beaches. Well-formed strand vegetation, therefore, is generally absent except in protected coves, inlets, and lagoons.

Only nine species of obligate fresh-water plants have been recorded thus far from the Archipelago where all are rare, and are generally restricted to small, shallow ponds that become free of ice early, owing to a favourable exposure. Only three species, *Pleuropogon Sabinei*, *Ranunculus trichophyllus* var. *eradicatus*, and *R. hyperboreus*, range north of the 80th parallel.

Collection and Preservation of Specimens

Most botanical specimens may be preserved by drying, and a collection of plants preserved in this manner is known as a herbarium. When thoroughly dried, most plant specimens keep indefinitely if properly protected against breakage and insect attack. This is best done by mounting the flat, dried specimens by means of narrow strips of gummed paper or tape (but not "adhesive" or "Scotch" tape) or by gluing, on fairly stiff sheets of white paper of uniform size. When properly mounted and labelled, the sheets may be sorted into genera and a suitable number placed in a "genus cover" made of stiff manilla paper, or in a portfolio. For additional protection the herbarium should be kept in a dust- and insect-proof cabinet.

In the field it is important that good and representative specimens of average size and habit should be selected. Whenever possible, the whole plant should be taken. The root should be carefully dug by the use of a trowel, a hunting knife, or some similar tool, because subterranean rhizomes and tubers are easily broken and overlooked if the plant is merely pulled. Whenever possible, plants bearing flowers and fruits should be selected because the identification of some species is difficult or unsatisfactory unless mature fruits are present. Mature fruits are particularly important for the determination of members of the sedge and willow families, whereas in the equally difficult grass family, fully developed flowers are more important than mature fruits. When possible, enough specimens should be taken to cover a sheet of paper 12 by 18 inches. When the plants are small, a number of specimens will be required to cover a sheet, whereas one or two branches or twigs of a shrub may be sufficient.

Every botanical specimen should be accompanied by at least a minimum of field data. These should always include the place and date of collection, the nature of the habitat, and its approximate elevation above sea-level. Because some flowers fade in drying, the colour of the petals should generally be noted. When only part of the plant is taken, as in the case of a large shrub, a note should be made of its height and general habit. These notes may be written on the sheet in which the plants are dried, or still better in a notebook specially kept for this purpose. In the latter case the specimens are numbered consecutively and the numbers written first on the drying sheet and then in the notebook. When a notebook is kept, a single statement at the top of the page will often suffice for each place or station where plants are collected.

Formerly, a so-called "vasculum"—an oblong tin box with a carrying strap—was used to preserve and carry the plants in the field. However, a portfolio, consisting of two, light, moderately flexible boards, measuring 12 by 18 inches, held together by stout tape or light straps passed through slits cut in the board, makes a convenient and more satisfactory means of preserving the plants during the day. In the portfolio is kept a supply of folders made of light, somewhat absorbent paper, measuring 16 by 22 inches. A dozen or two of these sheets are folded to 11 by 16 inches into a "book" so that specimens may be laid out flat between the leaves. Ordinary newspaper or newsprint is very satisfactory for this purpose. When the portfolio is closed, the slight pressure exerted by the straps will prevent the specimens from shifting. During the day the plants wilt slowly without losing their shape, and at the end of the day will be ready for transferring to the press. If for some reason it is not convenient to do this at once, the plants may safely remain in the portfolio for one or two days, if kept in a cool place. The paper in the portfolio may be used over and over, if it is aired and dried frequently; otherwise it may in time get mouldy.

A botanical press consists of a pair of light lattice frames measuring 12 by 18 inches made of slats of suitable wood 1½ inches wide and ¼ inch thick. The best frames are made of hickory slats held together by copper rivets. Two straps of leather or webbing supply adequate pressure and serve to hold the press together.

When ready for the press, the specimens collected during the day are transferred from the collecting portfolio to folded white sheets of newsprint measuring 11 by 16 inches. The folded sheets may be separated by single sheets of heavy blotting paper or felts, or better still by double-faced corrugated paper boards, 12 by 18 inches, of the strength and weight used for strong paper cartons. When the boards are cut, it is important that the corrugations should run across the board, not lengthwise, so that when the press is later suspended over a radiator or some other source of heat, warm air will pass through the corrugations and thus materially speed the drying of the plants. If corrugated boards are used, most plants will dry in 24 hours if artificial heat can be provided or if the presses are placed outdoors in a drying wind. If blotters are used, the plants will dry more slowly, depending on how often the blotters are changed and dried. A pinch of naphtha flakes sprinkled on the sheet will speed the drying and prevent moulding.

When proper collection equipment is not available, quite satisfactory specimens may be prepared merely by pressing the plants between newspaper sheets or between the leaves of a "pulp" magazine. Driers may be made from discarded paper cartons, and a couple of plywood boards and a strap will serve as a press.

The Keys

Botanical keys consist of a series of contrasting, and usually paired, (dichotomous keys) statements whereby it is possible, by a process of elimination to correctly and speedily place any plant, within the flora for which the key was constructed, in its proper family, genus, or species.

Most users of this manual will probably recognize the family and genus to which most plants in the Archipelago belong and will not need to consult the key to families and genera. If, however, a plant is wholly unfamiliar, that key will quickly guide the user to the proper place in the manual where keys to individual families and genera are found.

To use the key to families and genera, it is first necessary to determine whether the plant we wish to identify reproduces by true flowers and fruits, or by spores. If it is a flowering plant, the next step is to determine whether the flowers are 3- or 5-parted. If 5-parted (dicotyledons), a short-cut may be taken by deciding if the plant is an aquatic (Sect. 1.), woody (Sect. 2.), or a herbaceous land plant, and in the latter case, if it has a simple (Sect. 3.) or double perianth (Sect. 4).

Supposing our plant is woody, we proceed at once to Section 2, where the first choice is between simple or undivided leaves, and leaves divided or lobed. Having determined that our plant belongs in the first category, we note that it has petals and that they are free; next, that it is an evergreen dwarf shrub, and that its flowers are white and are arranged in umbels. This leads us to the genus *Ledum* and to page 130 where we find a detailed description. A glance at the illustration, fig. 57, a, b, at once confirms that our plant is *Ledum decumbens*, or Labrador tea.

The individual keys to families and genera are similar in structure. Whenever possible, characters that can be seen without the aid of a lens are used throughout, and only occasionally will a low-powered hand lens be needed.

The Maps

In the text, the description of species is followed by a note on the general distribution, stating whether the species is circumpolar or of limited or local range (endemic), and whether it is an arctic, boreal, or southern type. For the North American distribution the reader is referred to the individual maps at the end of the manual. On these maps, dots (or in a few instances other symbols as well) are used to indicate where the plant has been collected. In maps of such small scale it is not possible to place a dot for each actual collection; for many common plants each dot may therefore represent anywhere from a few to a score or more collections, all within the area covered by the dot, which, in the scale of the maps, represents an area of no less than 410 square miles, or more than 1,000 square kilometers.

Besides showing where each species has been collected within the Arctic Archipelago, its main range on the adjacent mainland and in Greenland[1] is given. This additional information will prove useful in understanding the North American range of species and provide a clue to their type of distribution by indicating whether of wide or local range. For a detailed analysis and statistical treatment of the flora the reader is referred to Bulletin 135.

The following 44 species, all recorded from eastern parts of the Archipelago, are likely to be discovered in the western islands. Nearly all are species of southern range that may be expected only in most favoured places.

Woodsia alpina
W. ilvensis
Lycopodium annotinum
Potamogeton filiformis
Agrostis borealis
Calamagrostis canadensis var. *Langsdorffii*
Deschampsia caespitosa
D. pumila
Poa alpigena s. str.
Puccinellia Langeana s. str.
Eriophorum brachyantherum
E. russeolum var. *albidum*
Scirpus caespitosus ssp. *austriacus*
Carex Lachenalii
C. gynocrates
C. supina ssp. *spaniocarpa*
C. bicolor
C. capillaris var. *major*
C. holostoma
Luzula Wahlenbergii
Salix arctophila
S. herbacea
S. planifolia
Koenigia islandica
Arenaria humifusa
A. uliginosa
Ranunculus lapponicus
R. Pallasii
R. trichophyllus var. *eradicatus*
Halimolobos mollis
Parnassia Kotzebuei
Potentilla nivea s. str.
Rubus Chamaemorus
Astragalus eucosmus
Oxytropis foliolosa
Epilobium angustifolium var. *intermedium*
Myriophyllum exalbescens
Diapensia lapponica
Loiseleuria procumbens
Pedicularis flammea
P. labradorica
P. lapponica
Pinguicula vulgaris
Antennaria Ekmaniana

The following 12 species now recorded from the western Archipelago, are likely to be discovered in the eastern islands, and all except those marked with an asterisk, in southern Baffin Island.

Festuca rubra var. *arenaria*
Hierochloe odorata
Salix alaxensis
Anemone parviflora
A. Richardsonii
Ranunculus Cymbalaria
*Braya humilis ssp. arctica
*Parrya arctica
*Dryas punctata
Pyrola secunda var. *obtusata*
Primula stricta
Lomatogonium rotatum

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[1] The ranges shown for Greenland are based largely on records in the National Herbarium of Canada, supplemented by information contained in the publications of Danish and Norwegian botanists and especially in maps published by T. W. Böcher, P. Gelting, G. Seidenfaden, and Th. Sørensen. The distribution for East Greenland was kindly checked with T. W. Böcher in 1954.

SYSTEMATIC SECTION

Descriptive Flora of the Canadian Arctic Archipelago

Artificial Key to the Families and Some Genera

Vascular plants without true flowers and fruits, reproducing by spores borne in sporangia
I. Ferns and Fern-Allies (PTERIDOPHYTES)

Vascular plants, normally reproducing by seeds, never by spores
II. Flowering Plants (SPERMATOPHYTES)

Parts of the flower nearly always in threes, never in fives; leaves parallel-veined; ours all linear-leaved, grass-like plants with small, inconspicuous flowers
A. MONOCOTYLEDONS

Parts of the flower usually in fives (but in *Cruciferae, Papaveraceae,* and *Chrysosplenium* in fours, and in *Polygonaceae* sometimes in threes). Leaves usually net-veined, if parallel-veined not grass-like plants
AA. DICOTYLEDONS (Sects. 1–4)

Aquatic plants, normally with emergent inflorescence
AQUATIC PLANTS. SECT. 1

Plants with woody or partly lignified creeping or erect stems (shrubs or half-shrubs)
WOODY PLANTS. SECT. 2

Herbaceous terrestrial plants
  Perianth single *SECT. 3*

  Perianth double, consisting of dissimilar calyx and corolla *SECT. 4*

I. Ferns and Fern-Allies (PTERIDOPHYTES)

a. Leaves (fronds) mostly broad and fern-like 1. POLYPODIACEAE, p. 17
a. Leaves subulate, scale-like
  b. Stems cylindrical, conspicuously jointed; the nodes covered by whorls of scarious leaves 2. EQUISETACEAE, p. 19
  b. Stems not conspicuously jointed; covered by scale-like, imbricated, evergreen leaves 3. LYCOPODIACEAE, p. 19

II. Flowering Plants (SPERMATOPHYTES)

A. Monocotyledons

- a. Corolla or perianth lacking or rudimentary
  - b. Flowers not in the axils of chaffy bracts; perianth herbaceous, or none. Ours wholly or partly submersed aquatics — 4. POTAMOGETONACEAE, p. 21
  - b. Flowers in the axils of chaffy bracts
    - c. Stems cylindrical, hollow except at the nodes — 5. GRAMINEAE, p. 21
    - c. Stems usually 3-angled, or if cylindrical not hollow — 6. CYPERACEAE, p. 41
- a. Corolla or perianth present
  - d. Perianth chaff-like — 7. JUNCACEAE, p. 60
  - d. Perianth petaloid — 8. LILIACEAE, p. 63

AA. Dicotyledons

SECT. 1. AQUATIC PLANTS

- a. Leaves entire, in whorls of 4–8 leaves — Hippuris, p. 129
- a. Leaves finely divided
  - b. Leaves in whorls; the small flowers (when present) in terminal spikes — Myriophyllum, p. 128
  - b. Leaves alternate, flowers solitary and axillary, white or yellow — Ranunculus, p. 86

SECT. 2. WOODY PLANTS

- a. Leaves undivided, the margins entire or at most crenulate or serrate
  - b. Petals lacking
    - c. Flowers in unisexual catkins
      - d. Calyx none; fruits a capsule containing seeds with tufts of long, white hairs — 9. SALICACEAE, p. 64
      - d. Calyx present; fruit a winged nut or samara — 10. BETULACEAE, p. 70
  - b. Petals present
    - e. Petals united
      - f. Dwarf shrubs with fully lignified stems — 27. ERICACEAE, p. 130
      - f. Tussock-forming half-shrub with leathery, shiny leaves and white flowers — Diapensia, p. 133
    - e. Petals free (sometimes lacking in *Empetrum*)
      - g. Heather-like dwarf-shrubs with evergreen, linear leaves
        - h. Flowers very small, solitary, and axillary; fruit a black, shiny berry — Empetrum, p. 125
        - h. Flowers in umbels, white; plant aromatic — Ledum, p. 130
      - g. Not heather-like; tussock-forming, with solitary large and creamy-white flowers — Dryas, p. 113
- a. Leaves divided or lobed
  - i. Petals united; flowers small in racemes or spikes of small, globular heads — Artemisia, p. 38
  - i. Petals free; flowers large and mostly showy — 19. ROSACEAE, p. 110

SECT. 3. HERBACEOUS, TERRESTRIAL PLANTS WITH A SINGLE PERIANTH

a. Flowers in a dense head on a common receptacle	38. COMPOSITAE, p. 144
a. Flowers not on a common receptacle	
b. Leaves simple, not deeply lobed or dissected	
c. Nodes of stems covered by a tubular sheath; fruit an achene	11. POLYGONACEAE, p. 71
c. Nodes not thus covered; fruit a capsule	
d. Leaves opposite	13. CARYOPHYLLACEAE, p. 74
d. Leaves alternate	Chrysosplenium, p. 110
b. Leaves divided or deeply lobed	Anemone, p. 84

SECT. 4. HERBACEOUS, TERRESTRIAL PLANTS WITH A DOUBLE PERIANTH

a. Petals free	
b. Annual	Montia, p. 73
b. Perennial	
c. Plants with opposite stem leaves	
d. Ovary superior	13. CARYOPHYLLACEAE, p. 74
d. Ovary inferior	23. ONAGRACEAE, p. 126
c. Plants with alternate stem leaves, or with a basal rosette	
e. Flowers irregular (zygomorphic)	20. LEGUMINOSAE, p. 117
e. Flowers regular (actinomorphic)	
f. Pistil 1	
g. Petals 4	
h. Ovary 1-locular	Papaver, p. 90
h. Ovary 2-locular	16. CRUCIFERAE, p. 91
g. Petals normally 5	
i. Stems scapose; flowers white	26. PYROLACEAE, p. 129
i. Stems leafy; flowers blue	Linum, p. 124
f. Pistils 2–several	
j. Stamens inserted below the pistil (hypogynous)	
k. Stamens more than 10	14. RANUNCULACEAE, p. 83
k. Stamens 10, or less	
l. Pistils more numerous than sepals and petals	14. RANUNCULACEAE, p. 83
l. Pistils of the equal number	17. CRASSULACEAE, p. 103
l. Pistils fewer than sepals and petals	18. SAXIFRAGACEAE, p. 104
j. Stamens inserted on the calyx or on the lower part of the pistil (perigynous)	
m. Stamens as many or twice as many as sepals and petals	18. SAXIFRAGACEAE, p. 104
m. Stamens more than twice as many as the sepals and petals	19. ROSACEAE, p. 110

a. Petals united	
n. Flowers crowded on a common receptacle	38. COMPOSITAE, p. 144
n. Flowers not on a common receptacle	
o. Stems scapose, from a basal rosette	
p. Scape 1-flowered	
q. Flowers regular, white	Diapensia, p. 133
q. Flowers irregular, blue	Pinguicula, p. 142
p. Scape several-flowered	
r. Inflorescence short, compound	
s. Inflorescence capitate	Armeria, p. 134
s. Inflorescence umbellate	Primula, p. 134
r. Inflorescence spicate	Plantago, p. 142
o. Stems leafy	
t. Leaves alternate; flowers regular	
u. Fruit a capsule	Campanula, p. 143
u. Fruit compound, of 4 nuts	Mertensia, p. 137
t. Leaves opposite	
v. Flowers regular	
w. Annual or biennial	Gentiana, p. 135
w. Perennial	
x. Petals 4	Veronica, p. 138
x. Petals 5	32. POLEMONIACEAE, p. 136
v. Flowers irregular	34. SCROPHULARIACEAE, p. 137 (except *Veronica*)

FAMILIES AND GENERA OF VASCULAR PLANTS IN THE FLORA OF THE CANADIAN ARCTIC ARCHIPELAGO

	Genera	Species
Polypodiaceae	3	5
Cystopteris(1)		
Dryopteris (1)		
Woodsia (3)		
Equisetaceae	1	3
Equisetum (3)		
Lycopodiaceae	1	2
Lycopodium (2)		
Potamogetonaceae	1	1
Potamogeton (1)		
Gramineae	17	47
Agropyron (1)		
Agrostis (1)		
Alopecurus (1)		
Arctagrostis (1)		
Arctophila (1)		
Calamagrostis (5)		
Colpodium (1)		
Deschampsia (4)		
Dupontia (2)		
Elymus (1)		
Festuca (3)		
Hierochloe (3)		
Phippsia (1)		
Pleuropogon (1)		
Poa (11)		
Puccinellia (9)		
Trisetum (1)		
Cyperaceae	5	46
Carex (33)		
Eleocharis (1)		
Eriophorum (8)		
Kobresia (3)		
Scirpus (1)		
Juncaceae	2	10
Juncus (6)		
Luzula (4)		
Liliaceae	1	2
Tofieldia (2)		
Salicaceae	1	16
Salix (16)		
Betulaceae	1	2
Betula (2)		
Polygonaceae	3	3
Koenigia (1)		
Oxyria (1)		
Polygonum (1)		
Portulacaceae	1	1
Montia (1)		
Caryophyllaceae	6	25
Arenaria (6)		
Cerastium (5)		
Melandrium (4)		
Sagina (3)		
Silene (1)		
Stellaria (6)		
Ranunculaceae	5	18
Anemone (2)		
Caltha (1)		
Coptis (1)		
Pulsatilla (1)		
Ranunculus (13)		
Papaveraceae	1	2
Papaver (2)		
Cruciferae	11	29
Arabis (2)		
Braya (3)		
Cardamine (3)		
Cochlearia (2)		
Descurainia (1)		
Draba (12)		
Erysimum (1)		
Eutrema (1)		
Halimolobos (1)		
Lesquerella (1)		
Parrya (2)		
Crassulaceae	1	1
Rhodiola (1)		
Saxifragaceae	3	18
Chrysosplenium (1)		
Parnassia (1)		
Saxifraga (16)		
Rosaceae	5	15
Dryas (2)		
Geum (1)		
Potentilla (10)		
Rubus (1)		
Sibbaldia (1)		
Leguminosae	4	16
Astragalus (3)		
Hedysarum (2)		
Lupinus (1)		
Oxytropis (10)		
Linaceae	1	1
Linum (1)		

FAMILIES AND GENERA OF VASCULAR PLANTS IN THE FLORA OF THE CANADIAN ARCTIC ARCHIPELAGO—Concluded

	Genera	Species
Empetraceae.......... Empetrum (1)	1	1
Onagraceae............ Epilobium (4)	1	4
Haloragaceae.......... Myriophyllum (1)	1	1
Hippuridaceae.......... Hippuris (1)	1	1
Pyrolaceae............ Pyrola (2)	1	2
Ericaceae............. Arctostaphylos (2) Cassiope (2) Ledum (1) Loiseleuria (1) Phyllodoce (1) Rhododendron (1) Vaccinium (2)	7	10
Diapensiaceae.......... Diapensia (1)	1	1
Primulaceae........... Androsace (2) Primula (1)	2	3
Plumbaginaceae........ Armeria (1)	1	1
Gentianaceae.......... Gentiana (1) Lomatogonium (1)	2	2
Polemoniaceae.......... Phlox (1) Polemonium (1)	2	2
Boraginaceae........... Mertensia (2)	1	2
Scrophulariaceae........ Bartsia (1) Castilleja (2) Euphrasia (1) Pedicularis (8) Veronica (1)	5	13
Lentibulariaceae........ Pinguicula (1)	1	1
Plantaginaceae......... Plantago (2)	1	2
Campanulaceae......... Campanula (2)	1	2
Compositae............ Antennaria (5) Arnica (1) Artemisia (4) Aster (1) Chrysanthemum (1) Crepis (1) Erigeron (4) Matricaria (1) Petasites (2) Senecio (3) Solidago (1) Taraxacum (5)	12	29
	115	340

Families..	38
Genera..	115
Species and major geographical races..........................	340

I. PTERIDOPHYTES (Ferns and Fern-Allies)

1. POLYPODIACEAE Fern Family

Sori with a distinct indusium	
Stipe wiry, glabrous or covered by chaffy scales, yellowish-green or brown, not translucent; indusium divided into hair-like segments	1. Woodsia
Stipe fragile, more or less translucent; indusium unilateral, hood-like	2. Cystopteris
Sori (in ours) without indusium	3. Dryopteris

1. Woodsia R. Br. Woodsia

Low, tufted ferns with short, freely branched rhizome. Fronds pinnate, in ours the lower part of the stipe articulate. Sori round, borne on the back of the veins; indusium attached under the sori, divided into numerous hair-like segments.

Stipe brown, firm, wiry, and more or less chaffy	
Fronds lanceolate and stiff, permanently hairy and chaffy on the underside; stipes dark brown, covered with brownish chaff	1. *W. ilvensis*
Fronds oblong-lanceolate, glabrous or promptly glabrous; stipe pale brown, glabrous or with a few caducous scales	2. *W. alpina*
Stipe and rachis pale or straw-coloured; fronds linear, glabrous, yellowish-green, thin, and delicate	3. *W. glabella*

1. **W. ilvensis** (L.) R.Br.—Rootstock stout, ascending and freely branching, forming dense and firm tufts covered by the persisting, brownish-black stipe bases. Spores reticulate.

Dry, rocky places; usually on Precambrian or acid rocks. Thus far not recorded from the Western Archipelago and on the Arctic Coast known only from the mouth of Coppermine River.

General distribution: Circumpolar, wide-ranging, low-arctic.
Fig. 1,c. Map 1.

2. **W. alpina** (Bolton) S. F. Gray, not *W. alpina* of Am. Manuals — Similar, but fronds more delicate and less hirsute. Spores rugose-tuberculate.

Rock crevices and rock screes. Rare and local, and perhaps always on calcareous or non-acid, intrusive rocks. Thus far not recorded from the Western Archipelago, and on the Arctic Coast known only from the mouth of Coppermine River.

General distribution: Circumpolar, wide-ranging, arctic-alpine species.
Fig. 1,d. Map 2.

3. **W. glabella** R.Br.—Small, delicate plant with slender rootstocks, forming small tufts of yellowish-green, totally glabrous fronds.

Moist and often somewhat shaded rock crevices or talus slopes, always on calcareous rock.

General distribution: Circumpolar, wide-ranging, arctic-alpine.
Fig. 1,e. Map 3.

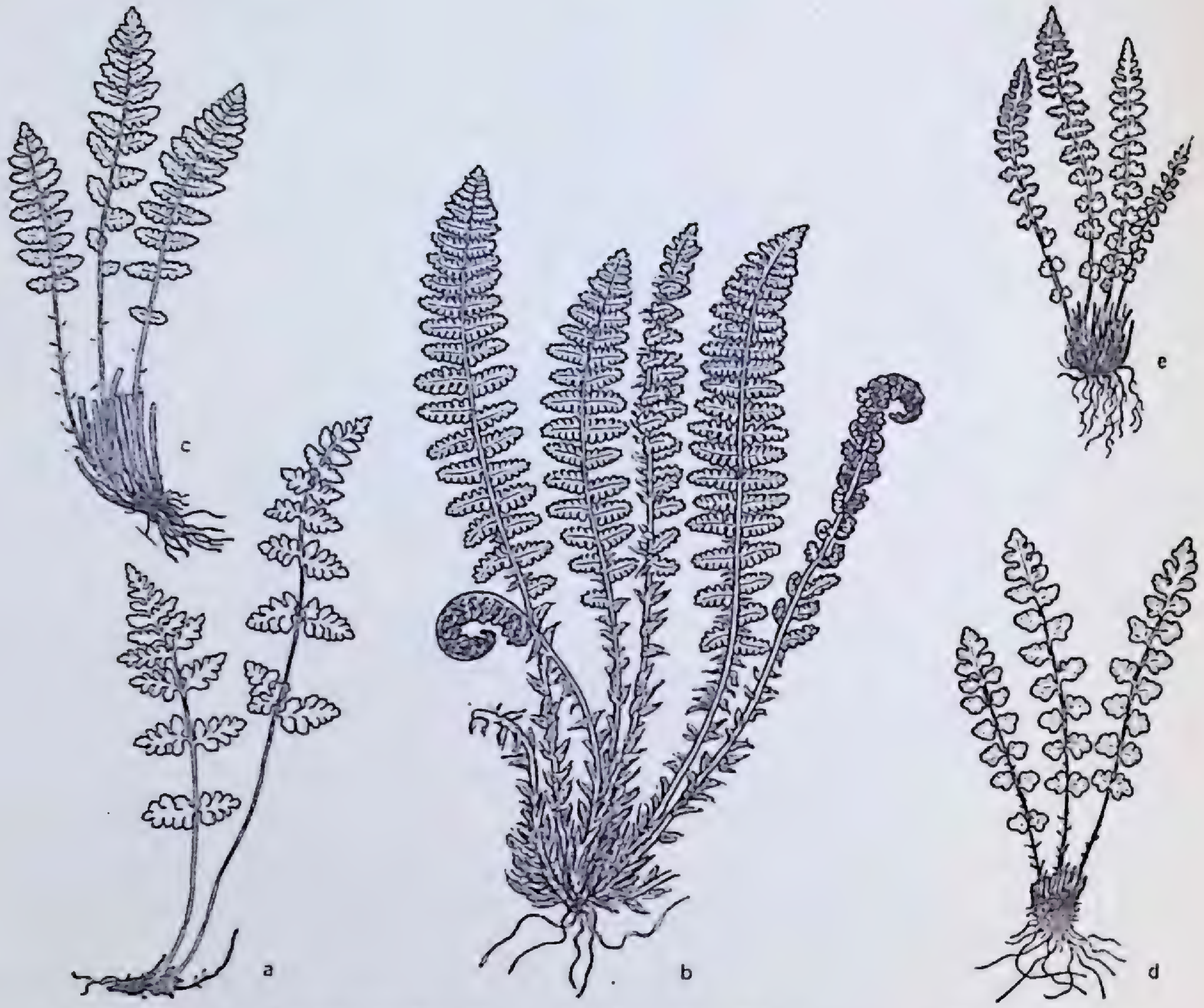

FIGURE 1. a. *Cystopteris fragilis.* b. *Dryopteris fragrans.* c. *Woodsia ilvensis.* d. *W. alpina.* e. *W. glabella.* (1/2)

2. CYSTOPTERIS Bernh. Bladder-fern

C. fragilis (L.) Bernh.—Small fern with delicate, lanceolate, finely dissected pinnate fronds, and shiny, somewhat translucent, brittle stipes. The sori roundish, and indusium hoodlike, caducous.

Fairly common in moist rock crevices and on moist gravelly screes or in herbmats, especially in the southern part of our area.

General distribution: Circumpolar, widely distributed, arctic-alpine. FIG. 1,a. MAP 4.

3. DRYOPTERIS Adans. Shield Fern

Dr. fragrans (L.) Schott.; FRAGRANT SHIELD FERN.—Coarse and densely tufted with a stout rootstock, covered by the persistent, shrivelled and curled old fronds. The live fronds 15 to 20 cm. high, stout and somewhat leathery, linear-lanceolate, dark green above, rust-coloured beneath, as well as on the rachis and stipe, from coarse chaff. The fronds remain green for several seasons and are spicy-fragrant in drying.

On cliffs and rock screes and always on non-calcareous rocks.

General distribution: Circumpolar, arctic-alpine. FIG. 1,b. MAP 5.

2. EQUISETACEAE Horsetail Family

1. Equisetum L. Horsetail

Perennial, spore-bearing plants with creeping, freely branched, shiny, black rootstocks; stems annual and perennial, simple or branched, jointed, hollow, cylindrical; the nodes solid, encased in a toothed sheath. Spore-bearing cone terminal.

Stems annual, dimorphic	1. *E. arvense*
Stems evergreen	
Stems stiff and straight; teeth of the sheaths 6–8	2. *E. variegatum*
Stems filiform, flexuous; teeth of the sheaths 3–4	3. *E. scirpoides*

1. **E. arvense** L. Common Horsetail—Fertile stems appearing in early summer, simple, erect, shortlived, and lacking chlorophyll. Sterile stems green and branched, erect or decumbent.

Common in not too dry sandy and gravelly places as well as in herb-mats and tundra.

General distribution: Circumpolar, widely distributed, arctic-alpine. Fig. 2,a,b,c. Map 6.

2. **E. variegatum** Schleich.—Tufted, with ascending, freely branched, rather stiff, straight stems.

Common, mostly in wet, calcareous, alluvial sand and clay, but not infrequent in moss by brooks.

General distribution: Circumpolar, wide-ranging, arctic-alpine. Fig. 2,d,e. Map 8.

3. **E. scirpoides** Michx.—Low and dwarfed, with freely branched, thin rhizomes, and stems often concealed among the stems of other plants.

Very rare within our area where it is probably always sterile and limited to most favoured habitats of the southernmost portion.

General distribution: Circumpolar, low-arctic. Fig. 2,f,g. Map 7.

3. LYCOPODIACEAE Club-Moss Family

1. Lycopodium L. Club-Moss

Low, moss-like, evergreen, spore-bearing plants with creeping or tufted, freely-branching stems, covered by rows of imbricated, scale-like leaves.

Sporangia in terminal strobiles	1. *L. annotinum*
Sporangia in the axils of the leaves	2. *L. Selago*

1. **L. annotinum** L.—Creeping stems mostly above ground, up to one metre long or more, with ascending fascicles of 5 to 10 cm. long, curved branches terminating in a sessile cone-like strobile. In our area represented by the arctic-alpine var. *pungens* (La Pylaie) Desv.

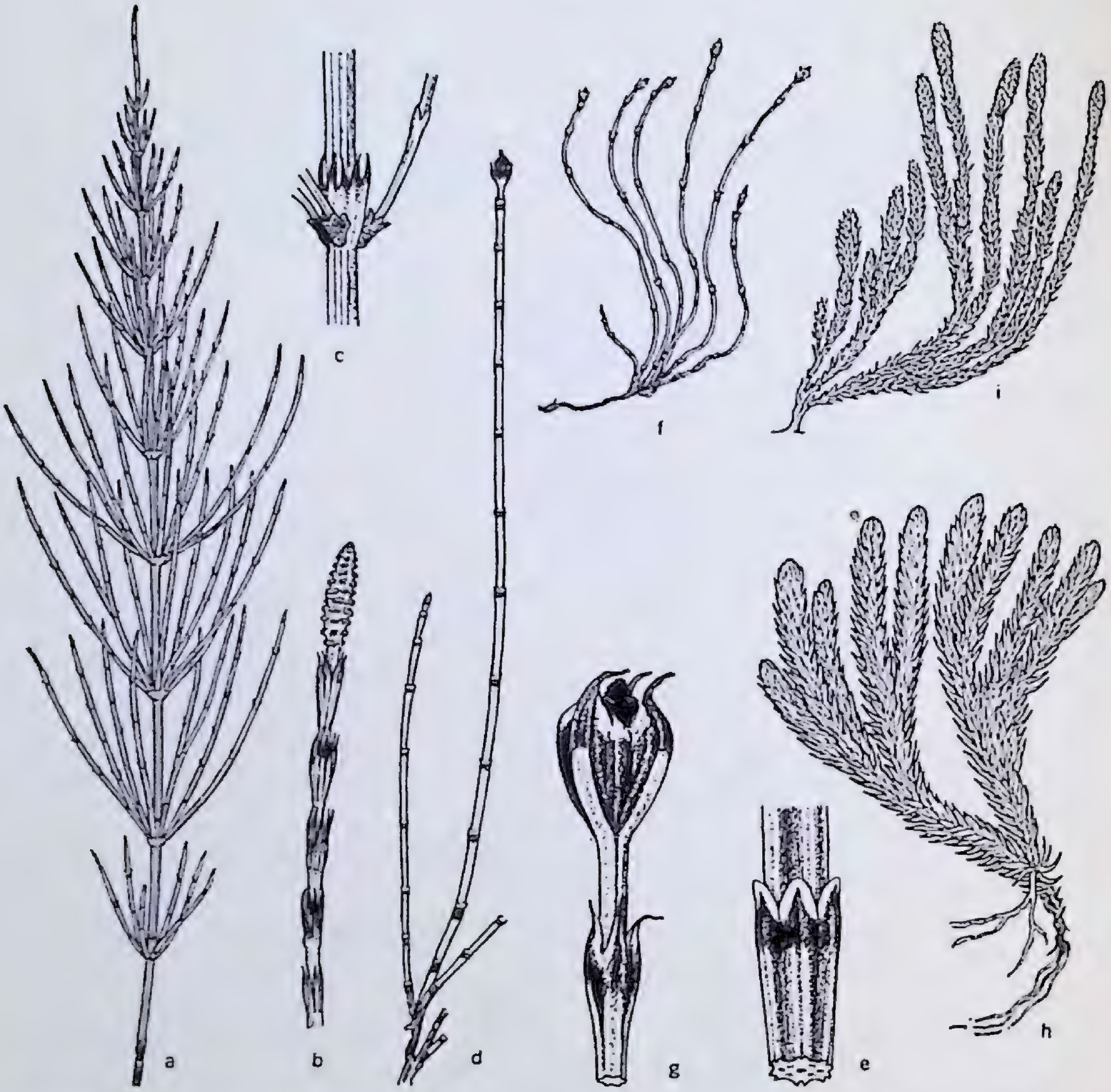

FIGURE 2. a, b, c. *Equisetum arvense.* d, e. *E. variegatum.* f, g. *E. scirpoides.* h. *Lycopodium Selago.* i. *L. annotinum* var. *pungens.* (1/2; c, 2/1; e, g 5/1)

Dry, sunny places, often in heath or herbmats. Rare in our area, where it is limited to Precambrian rocks of the southernmost islands. FIG. 2,i. MAP 9.

General distribution: Circumpolar, low-arctic.

L. alpinum L.—Creeping, pale green stem slightly beneath the surface, bearing tufts of glaucous flattened branches terminating in a sessile cone-like strobile.

Snowbeds and south-facing slopes. Circumpolar, low-arctic, alpine.

2. **L. Selago** L.—Forming small, isolated tufts from 2 to 15 cm. high with erect or ascending branches. In the Arctic represented by var. *appressum* Desv.

Somewhat rare in our area, where it is generally found in wet, peaty soil in tundra and chiefly on Precambrian rocks.

General distribution: Circumpolar, widely distributed, arctic-alpine. FIG. 2,h. MAP 10.

II. SPERMATOPHYTES (Seed Plants)

SPARGANIACEAE (Bur-reed Family)

SPARGANIUM L.

Sparganium hyperboreum Laest.—Submersed aquatic with creeping rhizome, flat, linear, sometimes floating leaves, and globular, bur-like, monoecious, short-pedunculate heads.

In shallow ponds; usually sterile near its northern limit. Circumpolar, subarctic.

4. POTAMOGETONACEAE Pondweed Family

1. POTAMOGETON L.

Potamogeton filiformis Pers.—Wholly submersed aquatic with widely creeping filiform stolons terminating in slender, white tubers. Stems branched, 10 to 15 cm. long, bearing flaccid leaves 0.2 to 0.5 mm. wide. Peduncles 5 to 10 cm. long, filiform, flexuous. Spike moniliform. In our area represented by the boreal race var. *borealis* (Raf.) St. John.

In mud in shallow lakes and ponds.

General distribution: Circumpolar, low-arctic. FIG. 3,a. MAP 11.

P. pusillus L. var. **mucronatus** (Fieb.) Graebn. *P. groenlandicus* Hagstr.—Wholly submersed aquatic with slender, freely branching stems; leaves brownish-green, linear, usually with a pair of small translucent glands at the base, 1 to 2 mm. wide, 3-nerved. Prominent winter buds form in the leaf axils. Usually sterile in the Arctic.

Muddy bottom of shallow ponds. Subarctic, eastern N. America.

JUNCAGINACEAE (Arrow-grass Family)

TRIGLOCHIN L.

Triglochin palustre L.—Tiny, rush-like marsh plant with a short, bulb-like rhizome emitting filiform, bulb-bearing stolons. Leaves slender, terete; scape slender, 10 to 15 cm. high, terminating in a few-flowered spike-like raceme.

Wet, brackish places. E. Arctic.

5. GRAMINEAE Grass Family

Annual or perennial herbaceous plants with jointed, usually terete and hollow culms, and linear alternate, 2-ranked, flat canaliculate or convolute leaves, each composed of a sheath, ligule, and blade. The much reduced, usually bisexual flowers, in spikelets of two-ranked, scale-like leaves. In the spikelet the lower scales (glumes) are sterile; each flower is supported by an outer scale (lemma) and usually enclosed by a smaller inner scale (palet); perianth lacking, stamens usually 3, stigmas plumose, 2, and the ovary superior; the fruit a grain. The spikelets variously arranged in panicles, racemes, or spikes.

a. Inflorescence paniculate
b. Spikelets 1-flowered
c. Panicle dense and spike-like — 2. ALOPECURUS
c. Panicle not spike-like
d. Panicle narrow; glumes minute, much shorter than the lemmas — 3. PHIPPSIA
d. Panicle open; glumes mostly longer than the lemmas
e. Floret with a long tuft of hairs (callus hairs) from its base; lemmas awned — 6. CALAMAGROSTIS
e. Floret lacking callus hairs
f. Glumes shorter than the awnless lemmas — 4. ARCTAGROSTIS
f. Glumes longer than the mostly awned lemmas — 5. AGROSTIS

b. Spikelets 2- to many-flowered
g. Spikelets with one terminal bisexual and two lateral staminate or sterile flowers — 1. HIEROCHLOE
g. Spikelets normally with only bisexual flowers
h. Lemma with a bent awn arising from the back
i. Lemma bidentate, awned from above the middle — 8. TRISETUM
i. Lemma erose dentate or entire, awned from below the middle — 7. DESCHAMPSIA
h. Lemma awnless or with an apical awn
j. Glumes longer than the spikelet — 13. DUPONTIA
j. Glumes shorter than the spikelet
k. Palet with two conspicuous bristles on each side — 10. PLEUROPOGON
k. Palet without such bristles
l. Nerves on the lemma nearly parallel
m. Glumes almost as long as the lowermost flower
n. Tall aquatic plants — 11. ARCTOPHILA
n. Dwarf terrestrial plant — 12. COLPODIUM
m. Glumes much shorter than the lowermost flower — 14. PUCCINELLIA
l. Nerves on the lemmas converging near the apex
o. Lemmas rounded on the back, terminating in a sharp point or short awn — 15. FESTUCA
o. Lemmas compressed and distinctly keeled, not terminating in a short point or awn — 9. POA

a. Inflorescence spike-like
p. Spikelets solitary at each node of the rachis — 16. AGROPYRON
p. Spikelets 2 or more from each node — 17. ELYMUS

1. HIEROCHLOE R. Br. Holy Grass

Glabrous, perennial grasses, with flat leaves and terminal panicles of somewhat shiny, yellowish-brown spikelets. The plant fragrant in drying.

Lemmas of sterile flowers with a long, geniculate and twisted awn — 1. *H. alpina*
Lemmas without such awns
Panicle narrow, with few spikelets; dwarf plant — 3. *H. pauciflora*
Panicle pyramidal; tall plant — 2. *H. odorata*

1. **H. alpina** (Sw.) R. & S.—Culms 10 to 30 cm. high, caespitose, basal leaves narrow, their sheaths conspicuously purplish. Panicle contracted.

Dry tundra and rocky places, chiefly on acidic rocks.

General distribution: Circumpolar, widespread, arctic-alpine. FIG. 3,c,d. MAP 12.

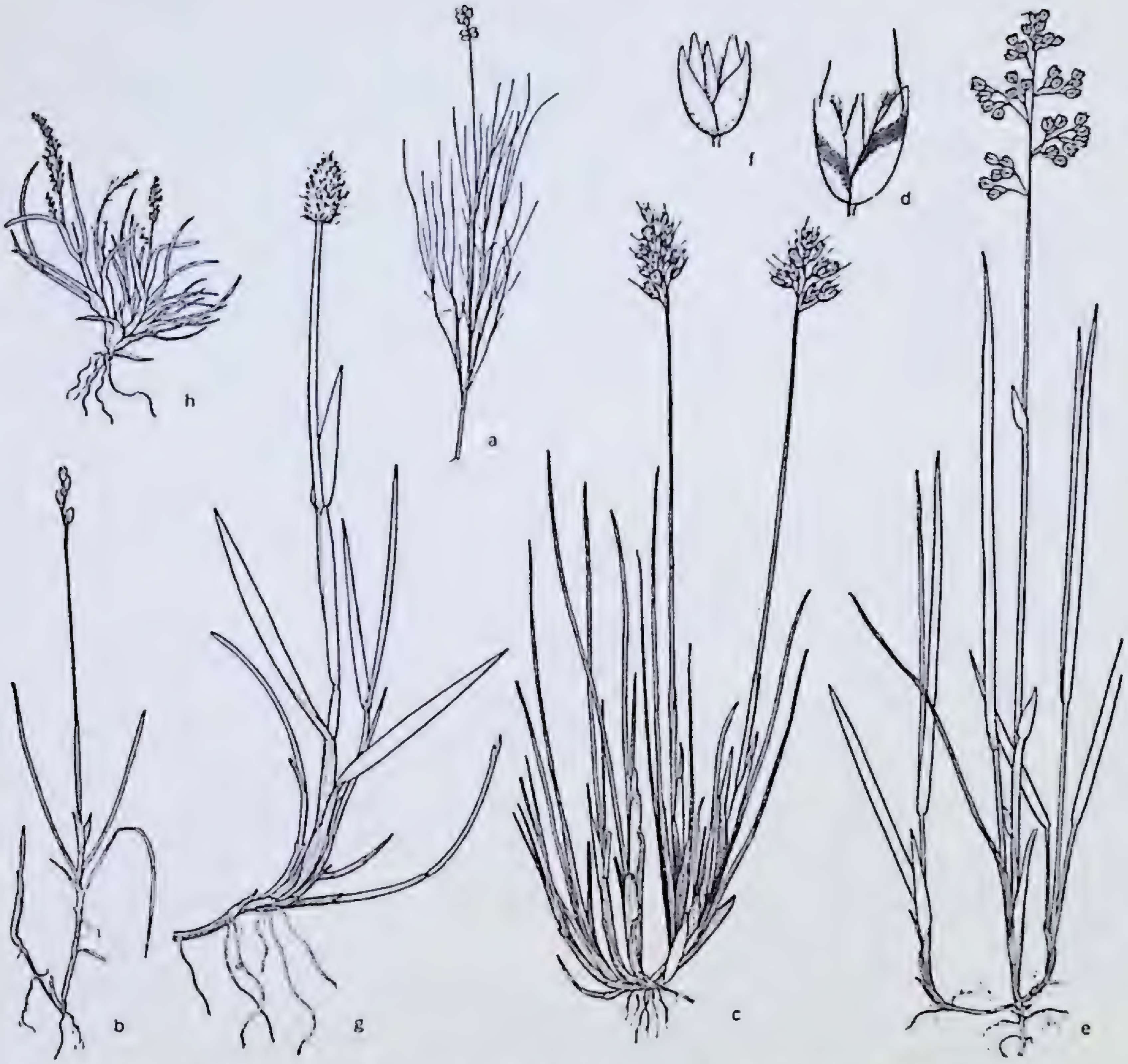

FIGURE 3. a. *Potamogeton filiformis* var. *borealis*. b. *Hierochloe pauciflora*.
c, d. *H. alpina*. e, f. *H. odorata*. g. *Alopecurus alpinus*.
h. *Phippsia algida*. (2/5; d, f 2/1)

2. **H. odorata** (L.) Beauv. Sweet Grass—Culms solitary, from a thin creeping rootstock; basal leaves short and broad, their sheaths not conspicuously purplish.

Sandy meadows and lake shores.

General distribution: Circumpolar, widespread, subarctic-alpine. FIG. 3,e,f. MAP 13.

3. **H. pauciflora** R. Br.—Low and delicate grass with very slender culms, 10 to 15 cm. high from a thin, creeping rootstock; panicle narrow, one-sided.

Occasional to common, generally growing in sphagnum in wet tundra. Although not littoral, a distinctly coastal and lowland species.

General distribution: Widespread, high-arctic. FIG. 3,b. MAP 14.

2. ALOPECURUS L. Foxtail

A. alpinus L.—Medium-sized grass with a short rootstock. Culm smooth 15 to 30 cm. high; panicle contracted into a short, spike-like head; leaves short, flat, and rather succulent, the upper sheaths somewhat inflated.

Common and widespread arctic grass growing in wet tundra and by brooks and lake shores. Although not littoral, the species is generally restricted to the seacoast. It is strongly nitrophilous and often forms a dense turf on manured soil, near human habitations or below bird cliffs. With fertilizer and a minimum of cultivation, *Alopecurus alpinus* provides good grazing for sheep and goats and will yield short but nourishing hay.

General distribution: Circumpolar, wide-ranging, high-arctic. FIG. 3,g. MAP 15.

A. aequalis Sobol.—Marsh grass with decumbent creeping stems, and flaccid floating leaves. Panicle spike-like, pale green.

In shallow, often summer-dry, ponds. Alaska to Labrador; in W. Greenland to lat. 71° N; Eurasia.

3. PHIPPSIA R. Br.

Ph. algida (Sol.) R. Br.—Caespitose, diminutive plant, 2 to 15 cm. high, with flat, yellowish-green, smooth leaves. Culms ascending, barely overtopping the leaves, panicle narrow; spikelets very small and caducous.

Occasional to rare on wet clay or among rocks by lake shores and alpine brooks, often near perennating snowbanks. Strongly nitrophilous and frequently found near human habitations.

General distribution: Circumpolar, widespread, high-arctic. FIG. 3,h. MAP 16.

4. ARCTAGROSTIS Griseb.

A. latifolia (R. Br.) Griseb.—Stoloniferous; culms smooth, 10 to 50 cm. high; leaves short, broad and flat, scabrous on both sides. Panicle narrowly lanceolate, dark purple, often somewhat interrupted below.

A common or even ubiquitous species rarely absent in any tundra formation.

General distribution: Circumpolar, widespread, arctic-alpine. FIGS. 4,c,d; 8, n. MAP 17.

5. AGROSTIS L. Bentgrass

A. borealis Hartm.—A low, densely tufted grass with pyramidal open panicle of small spikelets on long capillary branches.

In dry rocky and turfy places on acid rocks. Within our area recorded only from southern Baffin Island.

General distribution: Circumpolar, low-arctic. FIGS. 4,a,b; 8,m. MAP 18.

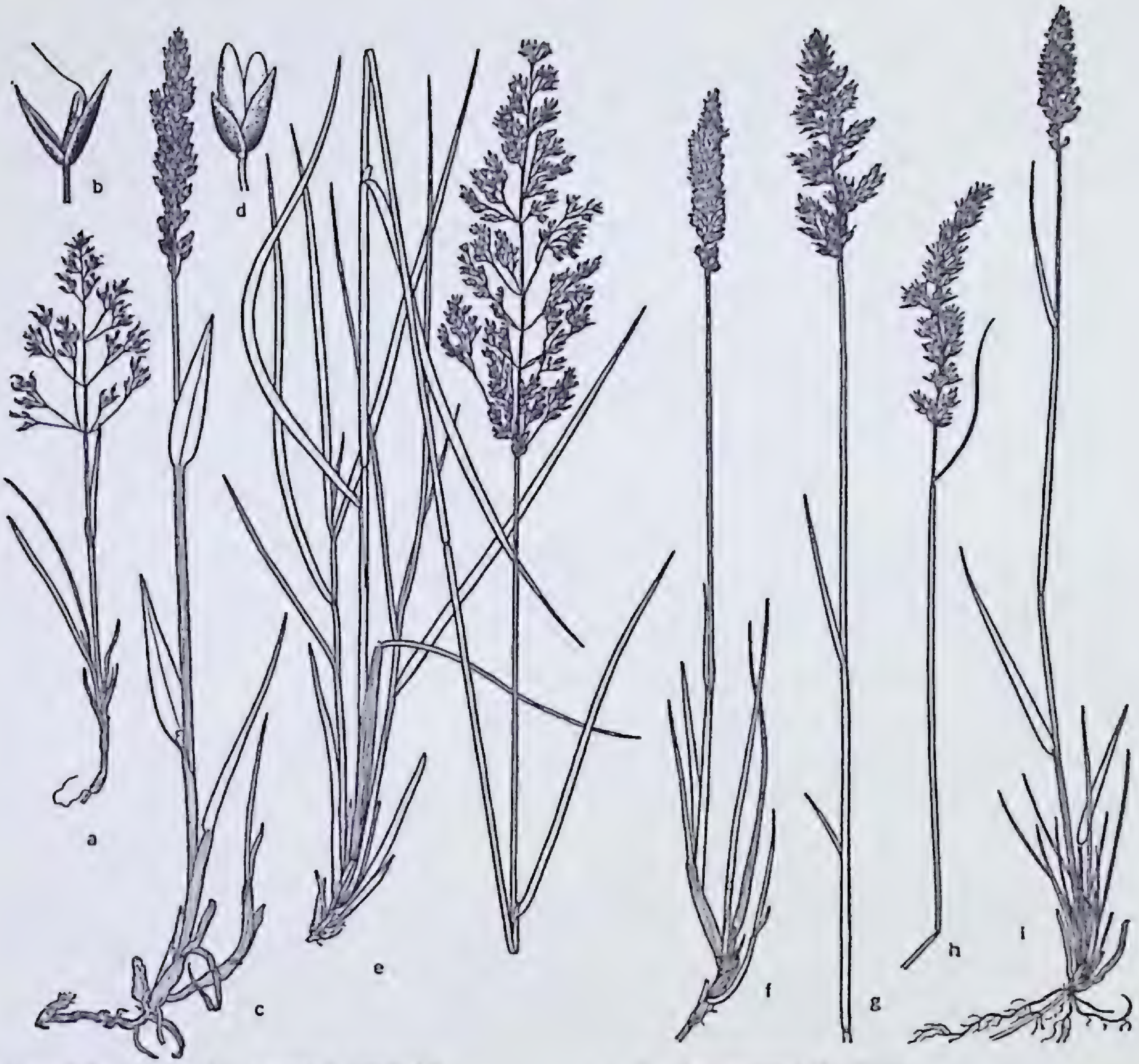

FIGURE 4. a, b. *Agrostis borealis.* c, d. *Arctagrostis latifolia.* e. *Calamagrostis canadensis* var. *Langsdorffii.* f. *C. purpurascens.* g. *C. chordorrhiza.* h. *C. lapponica* var. *nearctica.* i. *C. neglecta.* (2/5; b, d 4/1)

6. CALAMAGROSTIS Adans. Reed-Bentgrass

Perennial, medium to tall grasses with 1-flowered spikelets in terminal panicles. The lemmas with a distinct awn.

- Awn straight, barely if at all exserted
  - Tall, coarse species with soft flat or slightly rolled leaves
    - Panicle large, nodding; glumes very scabrous on the keel 1. *C. canadensis* var. *Langsdorffii*
    - Panicle narrower, erect; glumes smooth or very sparingly scabrous on the keel 2. *C. lapponica* var. *nearctica*
  - Low or medium species with culms rarely over 30 cm. high
    - Leaves densely fascicled, flat, and scabrous 3. *C. chordorrhiza*
    - Leaves smooth, rolled 4. *C. neglecta*
- Awn geniculate, distinctly exserted 5. *C. purpurascens*

1. **C. canadensis** (Michx.) Beauv. var. **Langsdorffii** (Link) Inman—A tufted, coarse grass with culms up to one metre tall, and scabrous, broad, flat leaves; panicle dark purple, about 20 cm. long.

In sheltered, well-watered places; in the Archipelago thus far recorded only from Lake Harbour in southern Baffin Island.

General distribution: Circumpolar, low-arctic. FIG. 4,e. MAP 19.

2. **C. lapponica** (Wahlenb.) Hartm. var. **nearctica** Porsild—Culms solitary or few together, stiff, 40 to 70 cm. high, with 2 internodes, much longer than the narrow, 2 mm. wide, flat or somewhat rolled leaves. Panicle oblong, narrow and lax, 4 to 8 cm. long, purplish tinged.

In moist sandy soil among willows, well-sheltered. A forest species which in our area has been doubtfully reported from southern Baffin Island.

General distribution: N. American, subarctic-alpine. FIG. 4,h. MAP 20.

3. **C. chordorrhiza** Porsild—Loosely caespitose with long, cord-like, widely branching, shiny rhizomes from which rise fascicles of flat glaucous leaves much shorter than the mostly solitary, geniculate-erect, 30 to 35 cm. tall, scabrous culms. Panicle lax and narrow, 5 to 6 cm. long, 1 to 1.5 cm. wide, more or less interrupted in the lower part.

Dry, calcareous, slaty or sandy slopes.

General distribution: Endemic of N.W. America where thus far it is known only from Mackenzie delta and Prince Patrick Island. FIG. 4,g. MAP. 21.

4. **C. neglecta** (Ehrh.) Fl. d. Wett.—Culms smooth, 20 to 30 cm. high, with a narrow, spike-like panicle; leaves involute.

Wet meadows and lake shores where it often forms pure stands.

General distribution: Circumpolar, low-arctic. FIG. 4,i. MAP 22.

5. **C. purpurascens** R. Br.—A coarse and tufted grass with 20 to 70 cm. high, very scabrous culms, and involute, stiff, scabrous leaves.

Calcareous, sandy, and rocky places, chiefly outside the Precambrian shield area.

General distribution: N. American, arctic-alpine. FIG. 4,f. MAP. 23.

7. DESCHAMPSIA Beauv. Hairgrass

Tufted, tall, medium to low, smooth grasses with somewhat shiny, purplish, 2-flowered spikelets in terminal panicles; lemmas with a slender, barely exserted awn.

Spikelets normally viviparous 1. *D. alpina*
Spikelets not viviparous.
  Panicle open, more or less pyramidal
    Culms 30-50 cm. high 2. *D. caespitosa*
    Culms 15-25 cm. high 3. *D. pumila*
  Panicle narrow and contracted; culms low 4. *D. brevifolia*

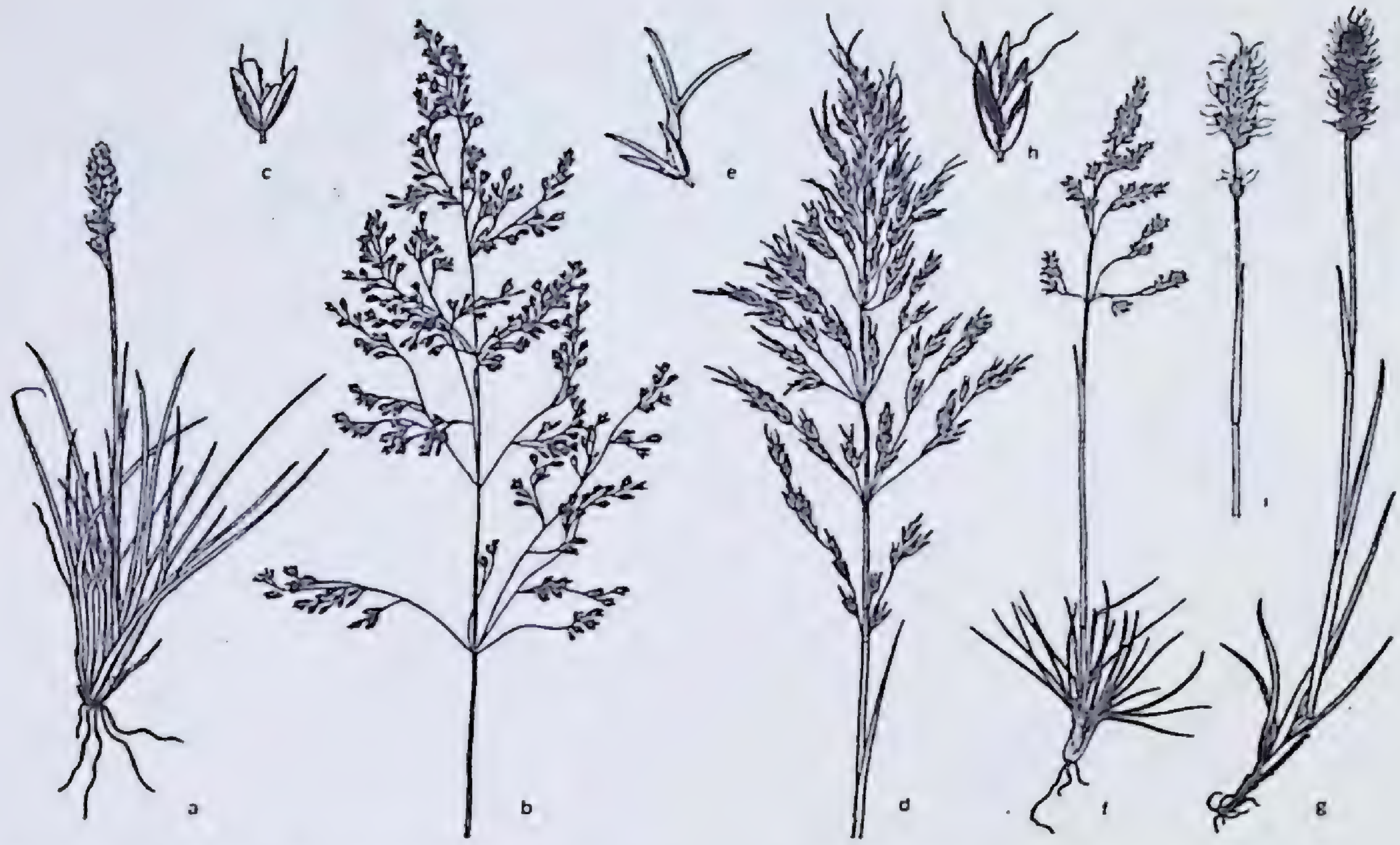

FIGURE 5. a. *Deschampsia brevifolia.* b, c. *D. caespitosa.* d, e. *D. alpina.* f. *D. pumila.* g, h. *Trisetum spicatum.* i. *T. spicatum* var. *Maidenii.* (2/5; e 1/1; c, h 2/1)

1. **D. alpina** (L.) R. & S.—A coarse, densely tufted grass with short, flat, or rolled leaves and 30 to 40 cm. tall culms. Panicle narrow; spikelets viviparous, lacking normal florets.

Wet gravelly places; alpine meadows or lake shores.

General distribution: Amphi-Atlantic, subarctic, oceanic. FIG. 5,d,e. MAP. 24.

2. **D. caespitosa** (L.) Beauv.—A coarse but smooth and densely tufted grass with culms 40 to 50 cm. high and large pyramidal panicle.

A variable species commonly found in wet meadows and on lake shores.

General distribution: Circumpolar, low-arctic. FIG. 5,b,c. MAP 25.

3. **D. pumila** (Trin.) Ostf.—Low and often sterile, usually forming dense mats of soft leaves. Culms, when present, solitary or few together; panicle open with few spikelets on capillary branches.

A seashore species usually growing in wet sand or clay among rocks.

General distribution: Endemic of arctic eastern N. America. FIG. 5,f. MAP. 26.

4. **D. brevifolia** R. Br.—Densely tufted dwarf grass; the culms 5 to 10 cm. tall, equalling or somewhat longer than the leaves. Panicle narrow and contracted, strongly suffused with purple.

A high-arctic grass growing in wet clay by river-banks or lake shores and occasionally in turfy places in dry tundra, often on the sides of owl perches.

General distribution: Amphi-Atlantic, high-arctic. FIG. 5,a. MAP 27.

D. flexuosa (L.) Trin.—Loosely tufted perennial with soft, convolute leaves. Culms smooth and shiny; panicle bronze-purple, somewhat shiny, the capillary branches spreading in age.

Dry, acid and turfy places. Boreal eastern N. America; Eurasia.

8. TRISETUM Pers.

T. spicatum (L.) Richt.—Caespitose, with erect culms 10 to 25 cm. high, and flat, more or less pubescent leaves and sheaths. Panicle lanceolate-oblong, dense and spike-like, somewhat shiny, suffused with purple and with a "fuzzy" appearance because of the protruding, prominently bent, twisted awns. In our area chiefly represented by var. *Maidenii* (Gand.) Fern., in which the panicle is interrupted, or less dense near the base.

Common in rocky and gravelly places in dry tundra.

General distribution: *T. spicatum* s. lat.: Circumpolar, arctic-alpine. FIG. 5,g,h (*T. spicatum*), i (var. *Maidenii*). MAP 28.

9. POA L. Blue Grass

Ours perennial grasses, with 2- to 6-flowered spikelets in narrow or open panicles. Glumes keeled, 1 to 3 nerved; lemmas awnless.

Stoloniferous	
Panicle mostly contracted, narrowly lanceolate, the branches approximately of equal length, each bearing 3–7 spikelets	1. *P. alpigena*
Panicle usually pyramidal, the lowermost branches spreading; spikelets mostly 2–3, at the tip of the very slender branches	2. *P. arctica*
Caespitose	
Basal leaves fresh green, very short and broad with blunt tips	3. *P. alpina*
Basal leaves narrower, with acuminate tips	
Leaves soft and flat, panicle pyramidal	2a. *P. arctica* ssp. *caespitans*
Leaves not flat and usually strongly convolute	
Culms and panicle branches scabrous; leaves strongly convolute glaucous	4. *P. glauca*
Culms and panicle branches smooth	
Panicles short, about twice as long as broad; dwarf species	5. *P. abbreviata*
Panicle narrow, usually thrice as long as broad	
Panicle soft, flexuous	7. *P. flexuosa*
Panicle stiff and contracted	
Ligules long and acuminate	6. *P. Hartzii*
Ligules short and blunt	8. *P. nascopieana*

1. **P. alpigena** (Fr.) Lindm.; *P. pratensis* of some authors on arctic flora.—Turf-forming, with rather stout, widely creeping, buried rhizomes. Culms mostly solitary, 20 to 30 cm. high, smooth, somewhat longer than the folded or rarely flat leaves. Spikelets 2- to 3-flowered; glumes equal; the lemmas obscurely 5-nerved, long, soft-pilose on the median and lateral nerves, with a copious tuft of cobwebby hairs at the base.

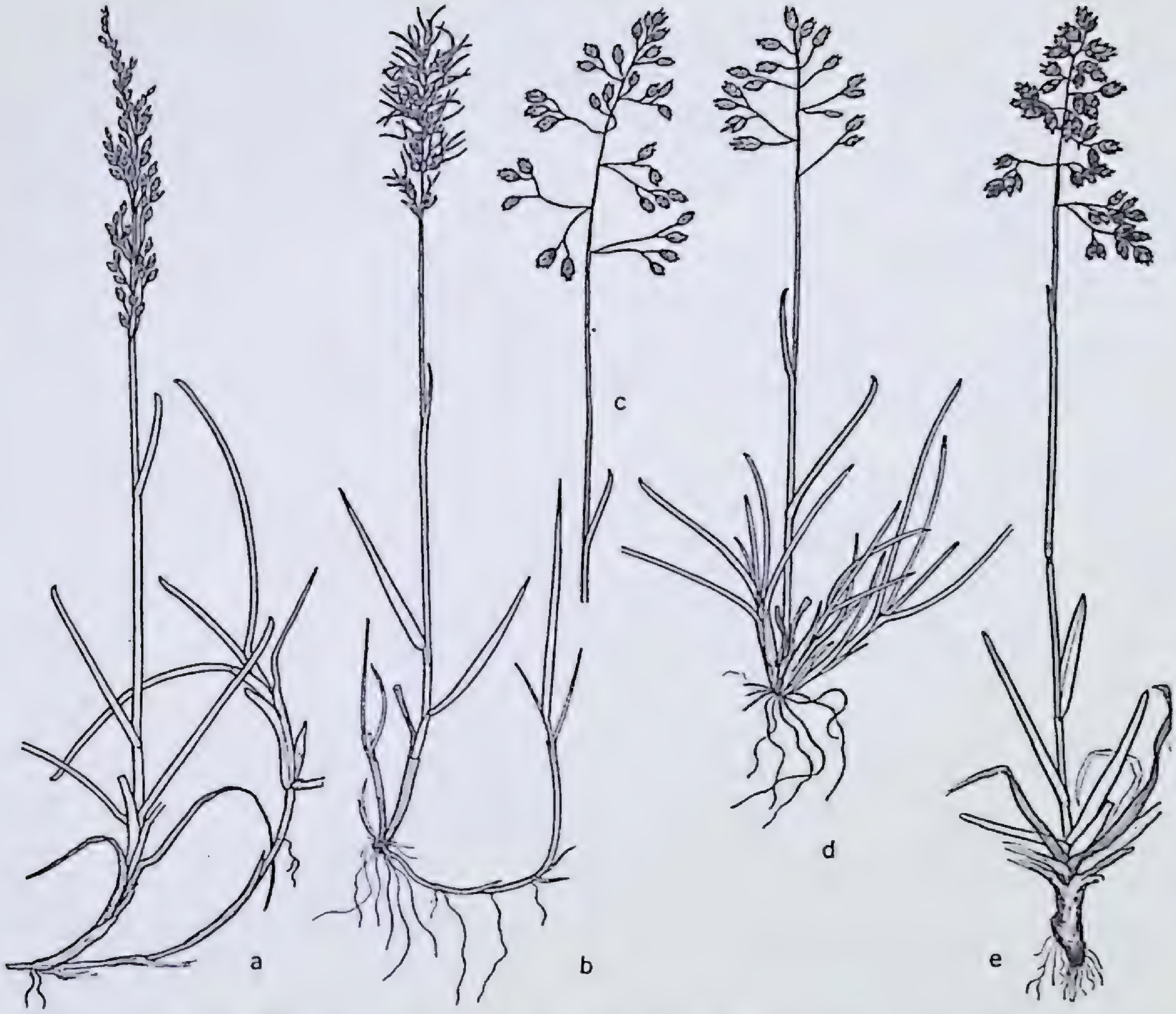

FIGURE 6. a. *Poa alpigena.* b. *P. alpigena* var. *colpodea.* c. *P. arctica.* d. *P. arctica* ssp. *caespitans.* e. *P. alpina.* (1/2)

Occasional to common in sandy tundra and in meadows by streams and lake shores, where it often forms a firm turf. It is strongly nitrophilous and greatly favoured by refuse and manure near human habitation or below bird cliffs and nesting sites. Although rather short for mowing, the species provides valuable pasture in Greenland, especially for goats and sheep.

In wet or heavily manured places, especially in the Far North, the species tends to become viviparous. Represented in northernmost Greenland and in the northern islands of the Arctic Archipelago by the mostly viviparous, narrow-panicled var. *colpodea* (Fr.) Schol.

General distribution: *P. alpigena* s.str.: Circumpolar, low-arctic; var. *colpodea:* Amphi-Atlantic, high-arctic. FIGS. 6,a; 8,c,i. MAP 29 (*P. alpigena* s. str.); FIG. 6,b. MAP 30 (var. *colpodea*).

2. **P. arctica** R. Br.—Similar, but with short, ascending rhizomes and not turf-forming. Culms ascending, often somewhat geniculate, usually several together, 15 to 25 cm. high, and mostly longer than the short and

usually involute leaves. As a rule easily distinguished from *P. alpigena* by its pyramidal panicle. Spikelets mostly 2-flowered; glumes equal; the lemmas soft pilose, especially in the lower part, without a web at the base.

Common or even ubiquitous in not too moist tundra, by lake shores and brooks. In the Eastern Arctic often represented by the well-marked ssp. *caespitans* (Simm.) Nannf., which is densely tufted, only occasionally rhizomatose, and has flat, soft leaves. This is always apomictic, and although anthers are present, they never contain good pollen. Like the var. *vivipara* Hook., ssp. *caespitans* is eastern arctic.

General distribution: *P. arctica* s.str.: Circumpolar, wide-ranging, arctic-alpine. Ssp. *caespitans*: Amphi-Atlantic, arctic. Figs. 6,c; 8,e,k. Map 31 (*P. arctica*); Fig. 6,d. Map 32 (*P. arctica* ssp. *caespitans*) and Map 33 (*P. arctica* var. *vivipara*).

3. **P. alpina** L.—Densely tufted with stout, crowded bases covered by the persistent white sheaths. Basal leaves short and flat, fresh green. Culms wiry, 15 to 30 cm. high; panicle green or purplish, oval to broadly pyramidal. Often viviparous in the Eastern Arctic.

Alpine slopes, usually on snowbeds.

General distribution: Circumpolar, low arctic-alpine. Fig. 6,e and 8,d,j. Map 34.

4. **P. glauca** M. Vahl.— Densely tufted. Culms stiff, 15 to 25 cm. high, slightly longer than the leaves. Culm and leaves glaucous and scabrous. Ligule very short. Panicle narrowly lanceolate.

Ubiquitous and often a pioneer species in exposed rocky or gravelly places where it often forms large, firm tussocks.

General distribution: Circumpolar, wide-ranging, arctic-alpine. Figs. 12,c; 8,f,1. Map 35.

5. **P. abbreviata** R. Br.—Caespitose dwarf species, often forming small, flat, or hemispherical tussocks. Culms 5 to 15 cm. high, smooth, somewhat arching, barely longer than the convolute, densely crowded, and usually somewhat curved leaves. Panicle short, oval, usually from 10 to 15 mm. long and from 5 to 8 mm. wide. Ligules short.

Common in dry tundra and turfy places, frequently growing on the sides of owl perches. Apparently a pronounced calcicole, which is restricted throughout its range to the Palæozoic or non-acid rocks.

General distribution: Amphi-Atlantic, high-arctic. Figs. 7,a; 8,a,g. Map 36.

6. **P. Hartzii** Gand.—Densely caespitose, usually forming rather small but very compact tussocks. Culms stiffly erect, smooth, 15 to 25 cm. high; leaves shorter than the culms, stiff and convolute, the ligule very prominent, 3 to 5 mm. long, acute. Panicle 3 to 5 cm. long and about 1.0 cm. wide, interrupted; spikelets somewhat shiny and variegated with bronze.

Usually growing in alluvial clay on river terraces and apparently limited to calcareous soils.

General distribution: Amphi-Atlantic, high-arctic. Figs. 7,b; 8,b,h. Map 37.

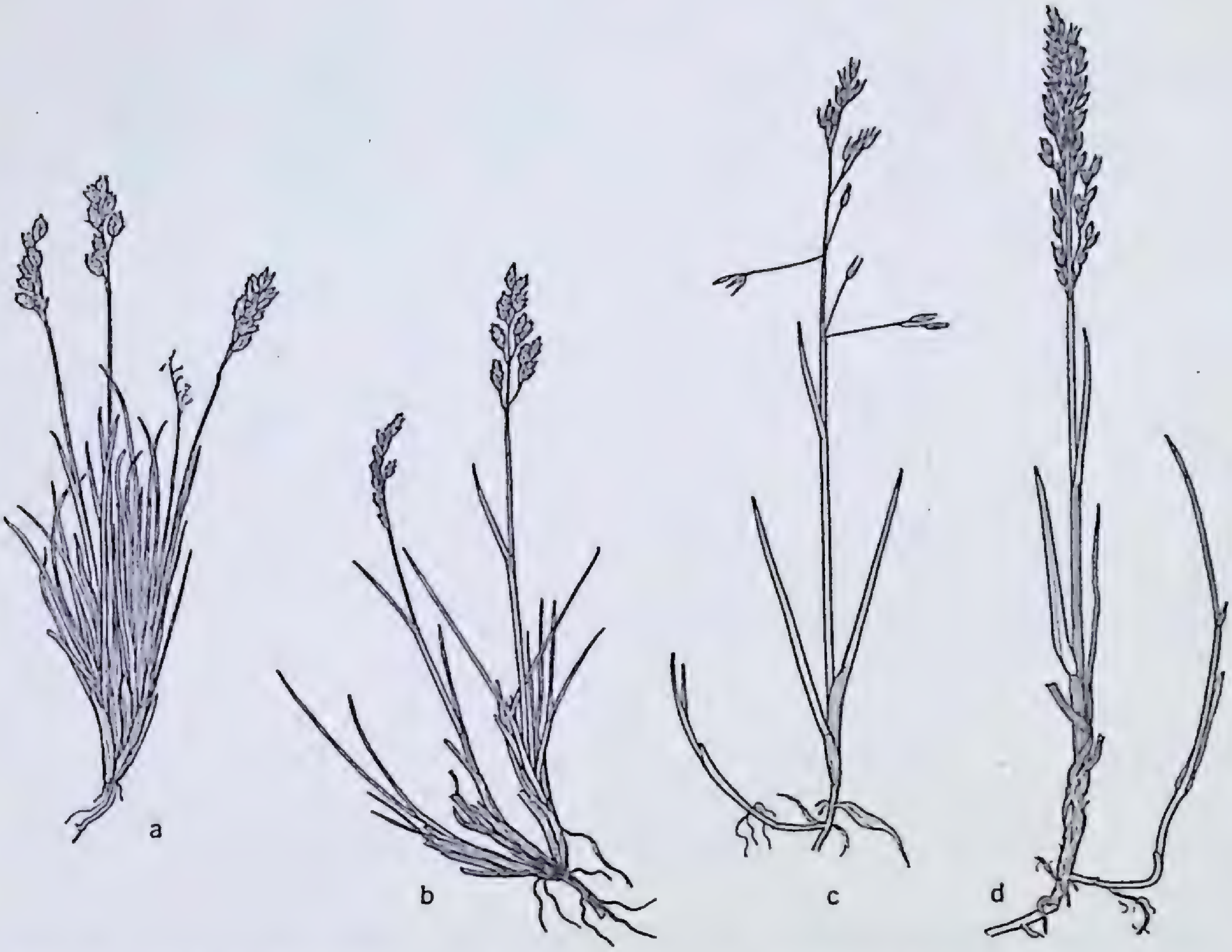

FIGURE 7. a. *Poa abbreviata.* b. *P. Hartzii.* c. *Dupontia Fisheri* var. *psilosantha.* d. *D. Fisheri.* (1/2)

7. **P. flexuosa** Sm.; *P. laxa* Haenke—Densely caespitose with soft, fresh green leaves; ligules 3 to 4 mm. long. Culms smooth, 10 to 20 cm. high, usually procumbent. Panicle narrow, contracted, and flexuous, often somewhat interrupted, with few-flowered, greyish-violet spikelets. Anthers very short.

In gravelly, not too dry places, often pioneering on fresh moraines.

General distribution: Amphi-Atlantic, low-arctic–alpine. MAP 38.

8. **P. nascopieana** Polunin—Caespitose, forming small tufts, in habit resembling *P. glauca,* from which it is at once distinguished by its smooth culms. Basal sheaths papery with a pink tinge; the leaves few and much shorter than the erect, somewhat arching, 10 to 25 cm. high culms; ligule short and broad, about 2 mm long. Panicle narrow, open, with very short branches that are often subtended by a peculiar scale-like bract. Spikelets few-flowered, purplish-green; lemmas soft-pilose; anthers 1.5 mm. long.

General distribution: Endemic of the eastern Arctic Archipelago and thus far collected only a few times in Baffin Island. MAP 39.

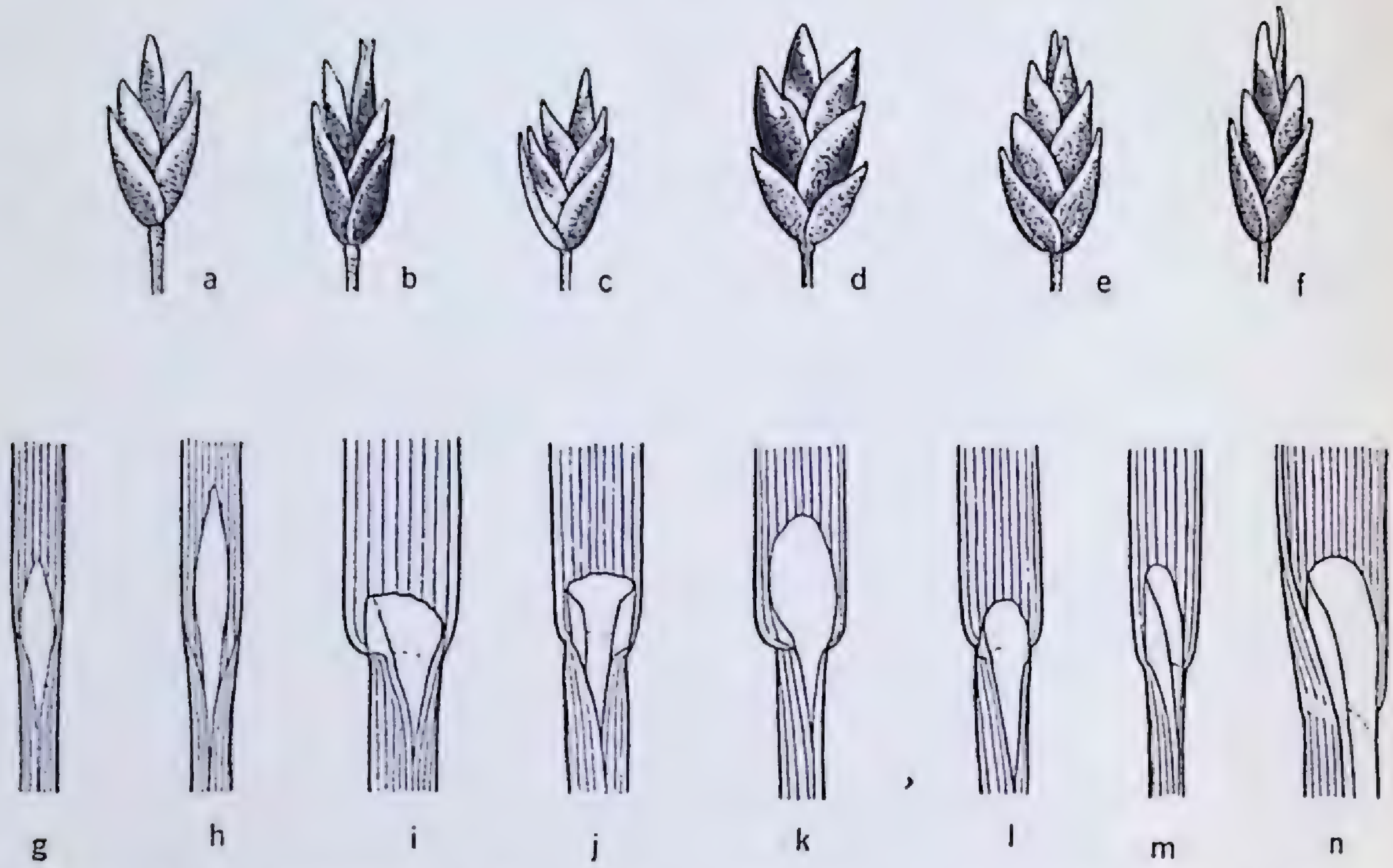

FIGURE 8. a–f. spikelets of *Poa.* a. *P. abbreviata.* b. *P. Hartzii.* c. *P. alpigena.* d. *P. alpina.* e. *P. arctica.* f. *P. glauca.* g–n. ligules. g. *Poa abbreviata.* h. *P. Hartzii.* i. *P. alpigena.* j. *P. alpina.* k. *P. arctica.* l. *P. glauca.* m. *Agrostis borealis.* n. *Arctagrostis latifolia.* (3/1)

10. PLEUROPOGON R. Br. Semaphore Grass

P. Sabinei R. Br.—Small, stoloniferous, aquatic grass with smooth, leafy culms 10 to 20 cm. high, and soft, flat, short leaves. Panicle racemose, one-sided, with from 5 to 7 linear, dark purplish, 5- to 8-flowered, drooping spikelets.

Occasional in shallow water growing on soft muddy shores of small sheltered ponds and tarns, where it may sometimes form pure stands.

General distribution: Amphi-Atlantic, high-arctic. FIG. 13,c. MAP 40.

11. ARCTOPHILA Rupr.

A. fulva (Trin.) Rupr.—Coarse aquatic grass with a stout, creeping rootstock and smooth, leafy culms 30 to 50 cm. high; leaves broad, flat, and smooth. Panicle pyramidal with long, drooping, capillary branches bearing from 2- to 7-flowered spikelets.

Growing in shallow water by the edge of tundra ponds and sloughs. Near its northern limit often sterile, propagating itself vegetatively.

General distribution: Circumpolar, low-arctic. FIG. 12,c. MAP 41.

12. COLPODIUM Trin.

Colpodium Vahlianum (Liebm.) Nevski; *Puccinellia Vahliana* (Liebm.) Scribn. & Merr.—Densely caespitose with pale, fibrous, crinkly roots; foliage yellowish-green with a peculiar metallic lustre. Culms stout, erect, 15 to 20 cm. tall, bearing 2 to 3 lax and flat leaves; withered basal leaf-sheaths very soft, early decaying. Panicle, 3 to 5 cm. long, contracted; branches in pairs, glabrous, ascending, bearing only a few spikelets. Spikelets lanceolate, 6.0 to 7.5 mm. long, dark-purple, shining, 2- to 4-flowered. Glumes and lemmas thin, translucent, subacute, their tips erose in age. Glumes subequal, 3.5 to 4.0 mm. long; lemmas 4.0 to 4.5 mm. long, copiously hairy in their lower part. Palea keels long-hairy. Anthers 1.0 to 1.2 mm. long. Grains about 2 mm. long.

A non-littoral species, often growing in moist clay by alpine brooks and on snowbeds.

General distribution: Amphi-Atlantic, high-arctic. Figs. 9,a,b,c; 10,d. Map 42.

13. Dupontia R. Br.

Stoloniferous, turf-forming, smooth marsh grasses, with culms 10 to 25 cm. high, and open or pyramidal panicle of somewhat shiny, bronze coloured spikelets.

Panicle usually narrow and contracted, with short, ascending branches bearing 2–4-flowered spikelets	1. *D. Fisheri*
Panicle usually pyramidal, open and interrupted, with long, spreading branches bearing 1–2-flowered spikelets	2. *D. Fisheri* ssp. *psilosantha*

1. **D. Fisheri** R. Br.—Culms from 10 to 25 cm. high, rather stout. Glumes firm, broadly lanceolate, 3-nerved, often obtuse, and shorter than the spikelet. Lemmas always appressed hirsute along the keel and margins, occasionally aristate (var. *aristata*); anthers 2 to 2.5 mm. long.

The high-arctic, polyploid race of the more southern and more widely distributed ssp. *psilosantha* (*D. psilosantha* Rupr.). *See* below.

Wet meadows on alluvial soil, such as in estuaries and on brackish lagoon shores, where it is occasionally flooded by high tides. Perhaps always maritime.

General distribution: Circumpolar, high-arctic. Fig. 7,d. Map 43.

2. **D. Fisheri** R. Br. ssp. **psilosantha** (Rupr.) Hult.—Similar, but as a rule lower, with narrower, somewhat involute leaves; shorter and truncate ligule; and spreading, interrupted, and more or less pyramidal panicle. Spikelets 1- to 2-flowered, the glumes thin, narrow, and long-acuminate, equalling the golden yellow, purple-tipped lemmas, which are perfectly glabrous on the back and have a tuft of hairs at their base. Anthers 1.5 to 2.0 mm. long, distinctly shorter than in *D. Fisheri.*

In similar places as preceding species but not strictly maritime and of less pronounced arctic range.

General distribution: Circumpolar, low-arctic. Fig. 7,c. Map 44.

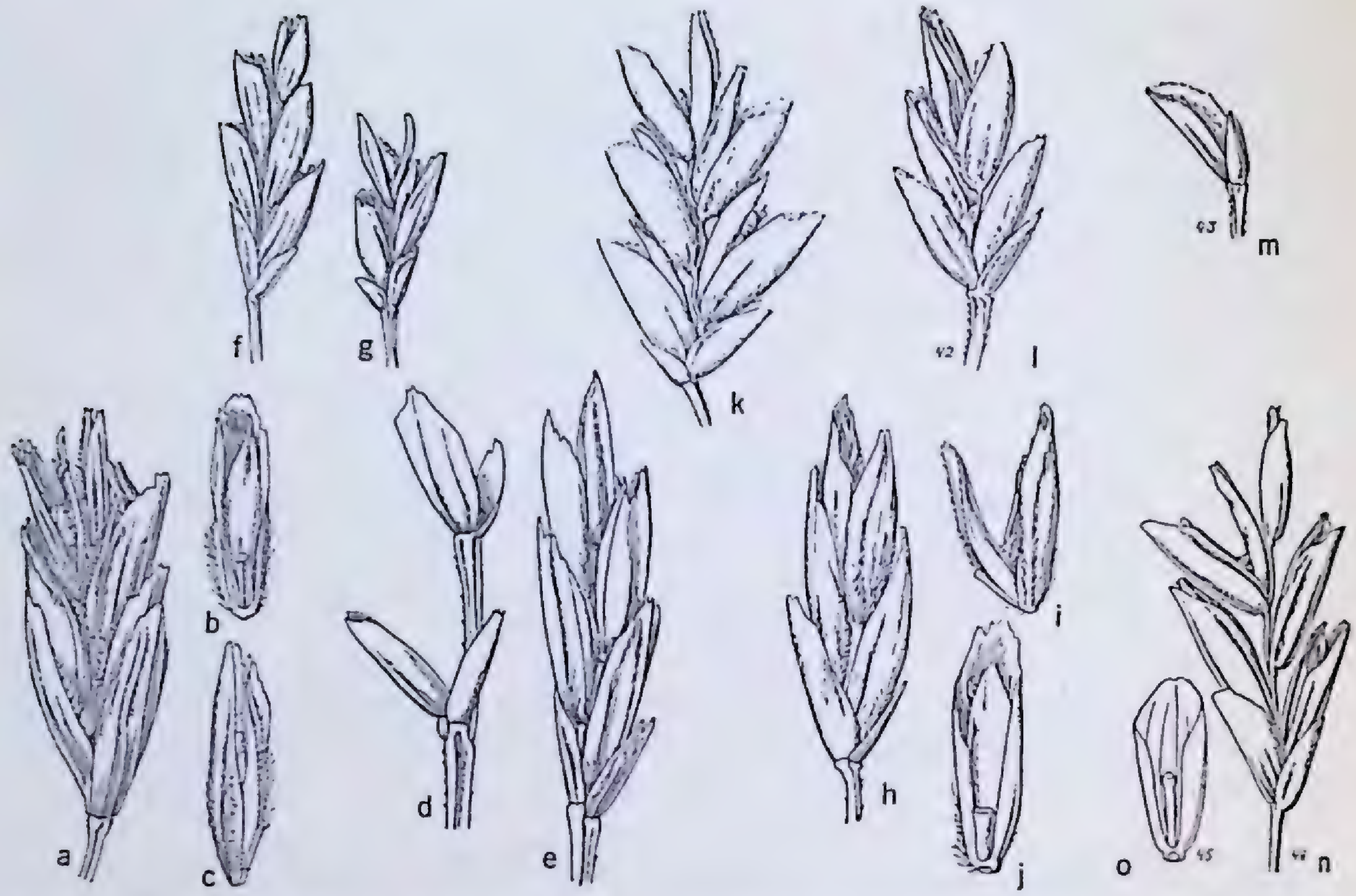

FIGURE 9. Spikelets of Colpodium and Puccinellia (after Th. Sørensen, 1953). a, b, c. *Colpodium Vahlianum.* d, e. *Puccinellia Andersonii.* f. g. *P. Langeana* ssp. *typica.* h, i, j. *P. angustata.* k. *P. vaginata.* l, m. *P. vaginata* var. *paradoxa.* n, o. *P. phryganodes.* (5/1)

14. PUCCINELLIA Parl.[1] Goose-grass

Caespitose or stoloniferous, yellowish-green, smooth grasses, usually growing near the seashore, although several are non-littoral, growing in alkaline or saline soil far from the sea. Spikelets 2- to many-flowered in open or narrow panicles; glumes unequal, much shorter than the spikelet.

a. Lemmas glabrous throughout; callus hairs lacking; keels of palea glabrous
  b. With stolons; flowering plants often caespitose. Lemmas 3.5–4.5 mm. long, obscurely nerved; anthers 1.5–2.0 mm. long, empty; plant sterile 6. *P. phryganodes*
  b. Without stolons; plant caespitose. Lemmas 1.5–2.5 mm. long, strongly nerved; anthers about 0.5 mm. long, containing pollen; plant fertile 5. *P. Langeana* ssp. *typica*
a. Lemmas hairy at the base; callus hairs present; keels of palea pilose or spinulose
    c. Pedicels thickened, glumes alternate; glumes and lemmas rather firm, straw-coloured at the margins, often coarsely toothed 3. *P. Andersonii*
    c. Pedicels not thickened, glumes approximately opposite; glumes and lemmas hyaline throughout or at least with hyaline margins, usually not toothed

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[1] The key and descriptions of *Puccinellia* species were kindly contributed by Th. Sørensen, Copenhagen. Ecological notes are by the present author.

d. Glumes and lemmas minutely erose-ciliolate. Panicle comparatively large, one-third to one-half the length of the culm
  e. Panicle branches slender, drooping; spikelets pedicellate; glumes rounded, very obscurely nerved 8. *P. vaginata*
  e. Panicle branches stiff; spikelets in part subsessile; glumes acute or acutish, evidently nerved 9. *P. vaginata* var. *paradoxa*
d. Glumes and lemmas entire, becoming erose in age, not ciliolate. Panicle one-fifth to one-quarter the length of the culm
    f. Anthers 1.2–2.0 mm. long. Panicle branches clearly fascicled
      g. Glumes and lemmas obscurely nerved; lemmas slightly pilose at the very base. Panicle contracted, linear-lanceolate 1. *P. agrostidea*
      g. Glumes and lemmas strongly nerved; lemmas strongly pilose in their lower fourth. Panicle spreading, oblong-pyramidal 7. *P. poacea*
    f. Anthers 0.6–1.0 mm. long. Panicle branches in pairs or rarely 3–4 from the lower node
        h. Panicle elongated, compound, though often thin and contracted; branches more or less scabrous. Spikelets lanceolate-oblong; lemmas straight. Ligule 2–4 mm. long, tapering. Culms usually about 20 cm. tall 2. *P. angustata*
        h. Panicle short, compact, subracemose; branches usually glabrous. Spikelets ovate; lemmas incurved. Ligule 1–2 mm. long, subacute. Culms usually about 10 cm. tall 4. *P. Bruggemanni*

1. **P. agrostidea** Th. Sør.—Caespitose, slender plant. Culms erect, 20 to 30 cm. tall with about 3 long-sheathing leaves. Ligules very thin, about 2 mm. long, truncate, often lacerate. Panicle intensely purple, shining, contracted, linear-lanceolate; branches fascicled, capillary, subglabrous; pedicels scaberulous. Spikelets 4 to 6 mm. long, 2- to 4-flowered; glumes and lemmas thin, transculent, obscurely nerved, entire; glumes acutish, about 1.0 and 2.0 mm. long; lemmas obtuse or abruptly pointed, 2.3 to 3.0 mm. long, faintly pilose at the very base. Anthers 1.2 to 1.5 mm. long.

A non-littoral species of turfy places in tundra.

General distribution: Endemic of western N. American Arctic. FIG. 10,b. MAP 45.

2. **P. angustata** (R.Br.) Rand & Redf.—Densely caespitose. Culms stout, 15 to 30 cm. tall, erect or prostrate, bearing only 1 to 2 leaves. Leaf-blades, especially those of the innovations comparatively wide, flat. Ligules thin, 2 to 4 mm. long, tapering. Panicle purple, 4 to 10 cm. long, commonly contracted; branches stout, more or less scabrous, ascending, in pairs or with accessory weaker branchlets from the lower node. Spikelets lanceolate, 6 to 8 mm. long, 3- to 5-flowered. Glumes usually acute, variable in shape, the tips rarely erose; lemmas about 3 to 4 mm. long, tapering, commonly with hyaline tips, more or less hairy on the nerves in their lower part. Anthers 0.6 to 0.8 mm. long. Grains 1.9 to 2.1 mm. long.

A non-littoral species commonly growing in moist clay spots in dry barrens.

General distribution: Circumpolar, high-arctic. FIGS. 10,a; 9, h,i,j. MAP 46.

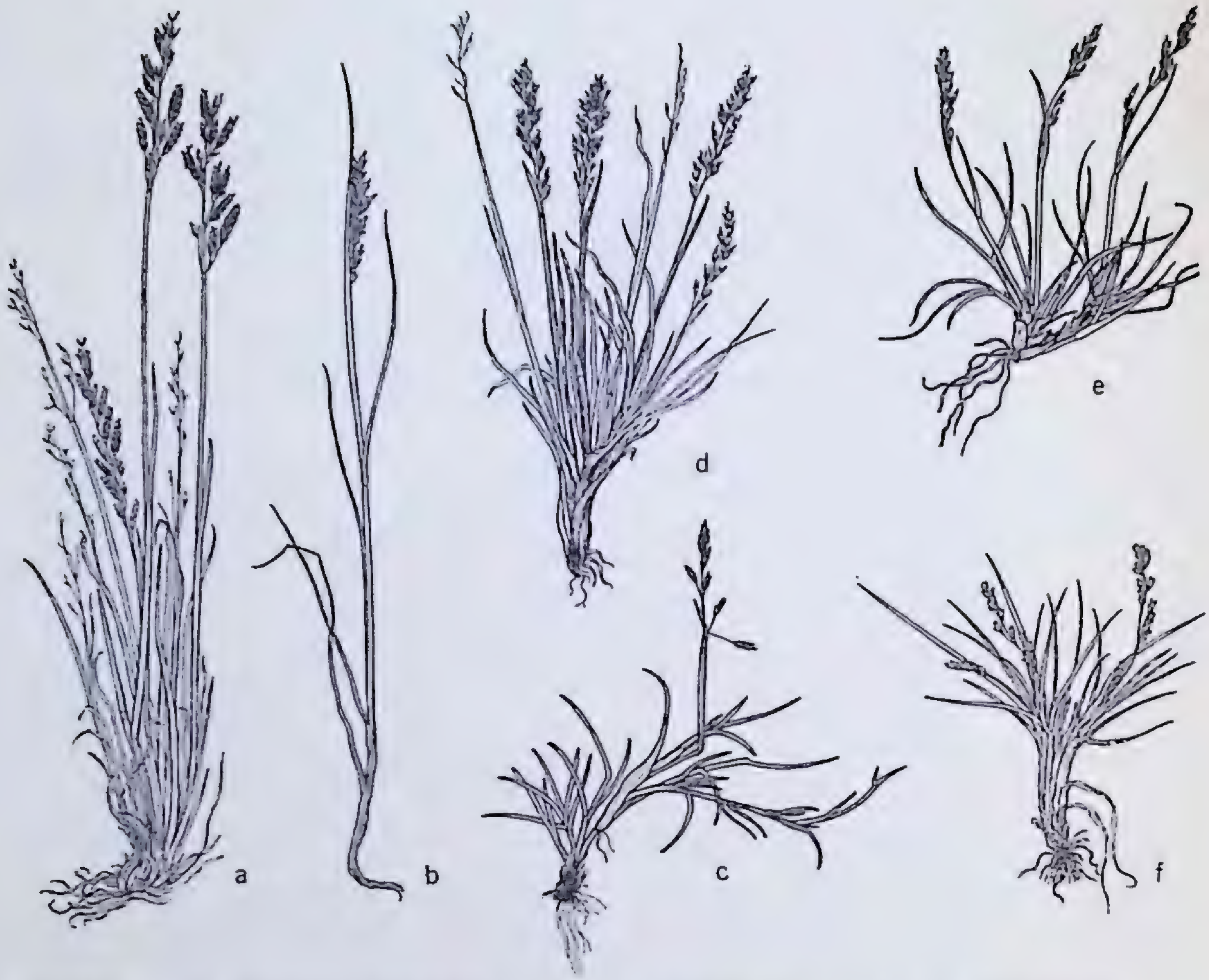

Figure 10. a. *Puccinellia angustata.* b. *P. agrostidea.* c. *P. Phryganodes.* d. *Colpodium Vahlianum.* e. *Puccinellia Bruggemanni.* f. *P. Langeana* ssp. *typica.* (1/2)

3. **P. Andersonii** Swallen—Caespitose, glaucescent. Culms stout, geniculate, 10 to 20 cm. tall. Leaves rather rigid, abruptly pointed; ligules 1.5 to 2.0 mm. long, acute, decurrent. Panicle up to 8 cm. long; branches glabrous, commonly in pairs, stiffly ascending or spreading. Spikelets rather few, comparatively large, 6 to 9 mm. long, 4- to 7-flowered, pale purple or reddish, the upper ones subsessile, appressed; rachilla stout, very fragile. Glumes and lemmas usually coarsely toothed. Glumes firm, the first 1.5 to 2.0, the second 2.5 to 3.0 mm. long, acute, evidently alternately inserted on the more or less thickened pedicels; lemmas rather firm, thinner, and with a peculiar fatty lustre toward the margin, 3 to 4 mm. long, sparsely pilose below. Anthers 0.8 to 1.0 mm. long. Grains 1.8 to 2.0 mm. long.

Wet, grassy places by the seashore.

General distribution: N. America, high-arctic, from E. Greenland to Alaska. Figs. 11,b; 9,d,e. Map 47.

4. **P. Bruggemanni** Th. Sør.—Densely caespitose. Culms stout, erect or prostrate, 5 to 10 cm. tall, with mostly withered leaves at the base; basal sheaths wide, scarious, shining. Ligules stout, 1 to 2 mm. long, acutish, decurrent. Panicle dark-purple, about 2 cm. long, dense, contracted;

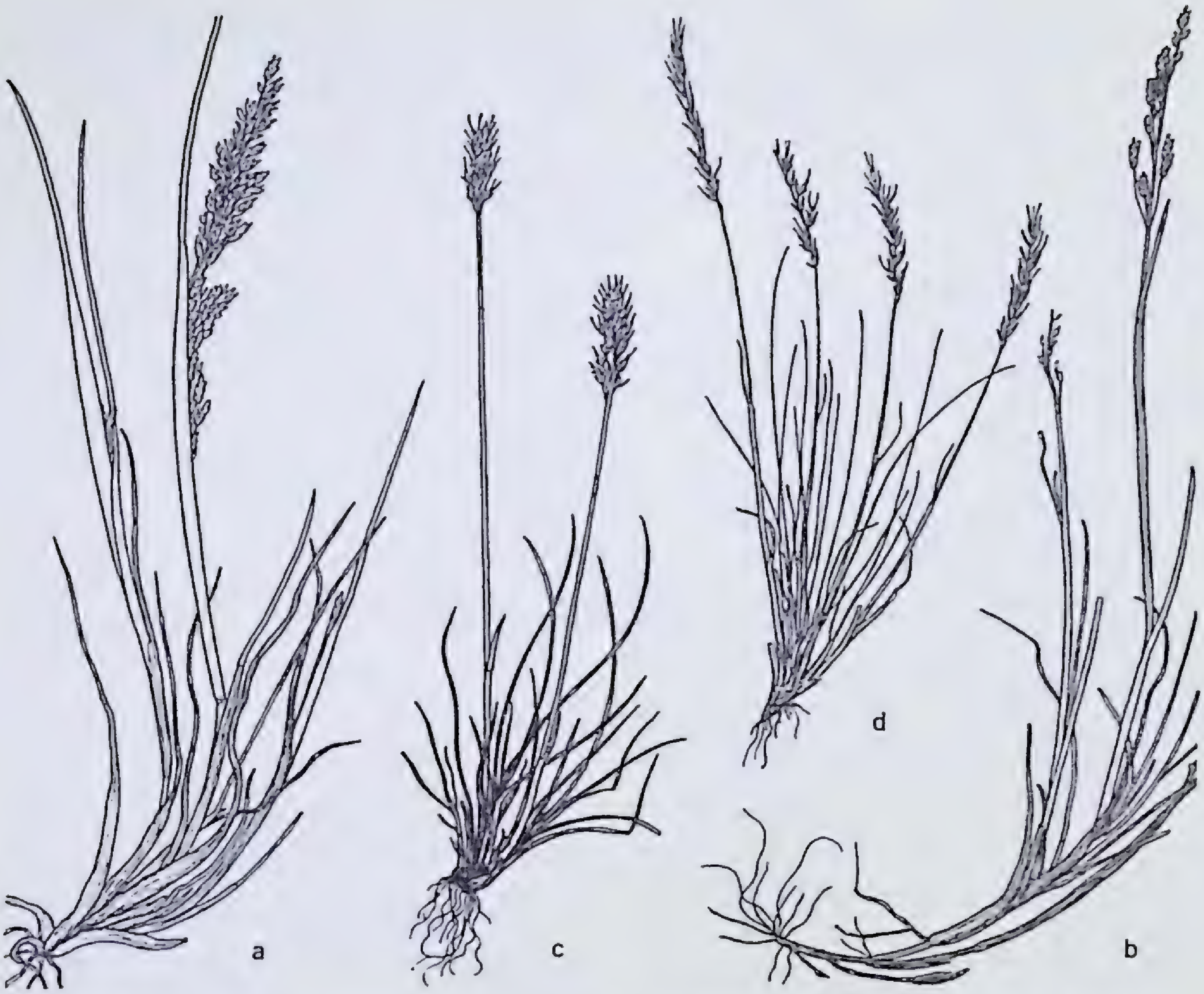

FIGURE 11. a. *Puccinellia vaginata.* b. *P. Andersonii.* c. *Festuca baffinensis.* d. *F. brachyphylla.* (1/2)

branches glabrous, in pairs or singly, bearing only 1 or 2 spikelets. Spikelets ovate, 4.5 to 6 mm. long, 3- to 4-flowered; glumes acute, sometimes sinuate-dentate at the tip, commonly herbaceous and greenish at the base; lemmas 3 to 3.5 mm. long, obtusish, incurved, pilose on the nerves in their lower third. Anthers 0.6 to 0.8 mm. long. Grains about 2 mm. long.

Apparently a non-littoral species.

General distribution: Endemic of the Canadian Arctic Archipelago. FIG. 10,e. MAP 48.

5. **P. Langeana** (Berl.) Th. Sør. ssp. **typica**—Plant loosely caespitose, often reddish tinged. Culms stout, erect, somewhat geniculate or even procumbent, usually 5 to 10 cm. tall, rarely taller. Leaves folded, abruptly pointed; ligules 1.5 to 2 mm. long, acutish. Panicle 3 to 5 cm. long, contracted or sometimes spreading; branches commonly in pairs, glabrous. Spikelets purple or greenish-variegated, 4 to 6 mm. long, florets 3 to 7, loosely imbricated, appressed, the upper ones often sessile; glumes and lemmas firm, herbaceous, entire, distinctly nerved. Glumes, 1 to 2 mm.

long, acutish, subcarinate; lemmas 1.5 to 2.5 mm. long, incurved, obtuse or bluntly acute. Lemma and palea keels glabrous; callus hairs absent. Anthers about 0.5 mm. long. Grains 1.2 to 1.4 mm. long.

A littoral species.

General distribution: N. American, low-arctic, from W. Greenland to Alaska and E. Asia with a large gap between Hudson Bay and Alaska. FIGS. 10,f; 9,f,g. MAP 49.

6. **P. phryganodes** (Trin.) Scribn. & Merr.—Turf-forming, matted with widely trailing stolons, from the leaf-axils of which develop short, rooting, easily detached shootlets. Flowering plant often caespitose with sessile innovations. Culms geniculate at the base or procumbent, the upper leaf-sheath elongated, often reaching the panicle. Leaves of flowering plant rigid, folded, abruptly pointed, glaucous; those of the stolons commonly flat, bright green. Panicle narrow and thin, of a few comparatively large spikelets; branches glabrous, stiffly ascending or reflexed. Spikelets variable up to one centimetre long or more, 3- to 6-flowered, pale purple or whitish. Glumes more or less flattened, obtuse; lemmas 3.5 to 4.5 mm. long, obtuse or even emarginate, entire, glabrous throughout; callus hairs absent. Anthers commonly 1.5 to 2.0 mm. long, thin, lacking pollen. Grains do not develop.

Common on clay by the seashore, where it grows in sheltered places subject to flood at high tide.

General distribution: Circumpolar, arctic. FIGS. 10,d; 9,n,o. MAP 50.

7. **P. poacea** Th. Sør.—Caespitose, rather stout plant. Culms 20 to 25 cm. tall, leafy only in their lower half. Leaves rather rigid, involute, setaceous. Ligules prominent, 1 to 2 mm. long, subtruncate, decurrent. Panicle dark-purple, open, oblong-pyramidal; branches fascicled, slender, scaberulous, spreading. Spikelets pedicelled, oblong, 6 to 7 mm. long, 4- to 5-flowered; glumes and lemmas rather thin, distinctly nerved; glumes often subcarinate, about 1.5 and 2.0 mm. long, acutish; lemmas 2.5 to 3 mm. long, rounded, broadly hyaline-bordered, the nerves pilose in their lower part. Anthers 1.5 to 2.0 mm. long.

In stiff clay of flood plains and lake shores.

General distribution: Endemic of Canadian Arctic Archipelago. FIG. 12,d. MAP 51.

8. **P. vaginata** (Lge.) Fern. & Weath.—Caespitose. Culms 10 to 20 cm. tall, slender, ascending; leaves soft, rolled when dried, the uppermost leaf-sheath usually subinflated. Panicle comparatively large, barely exserted; branches commonly in pairs, slender, more or less scabrous, ascending or drooping. Spikelets pedicelled, more or less purple, glossy, oblong, 5 to 10 mm. long, 4- to 6-flowered; glumes and lemmas thin, translucent, erose-ciliolate; glumes rounded, very faintly nerved; lemmas obtuse, 2.5 to 3.0 mm. long, sparsely pilose at the very base. Anthers 0.6 to 0.8 mm. long. Grains 1.7 to 1.9 mm. long.

On clay by the seashore; often forming large tussocks near bird cliffs and human habitations.

General distribution: N. American, arctic. FIGS. 11,a; 9,k. MAP 52 (solid circles).

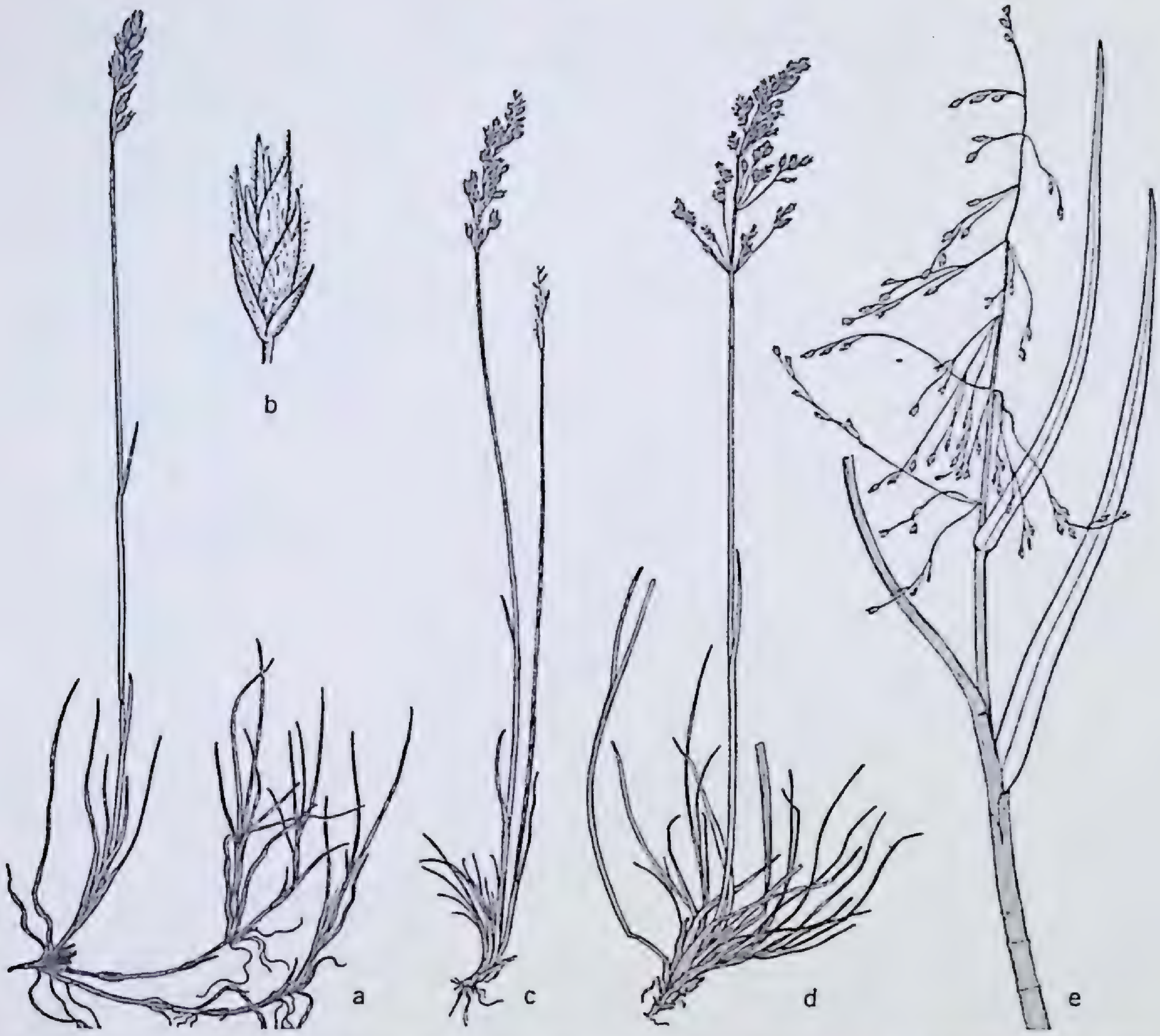

FIGURE 12. a. b. *Festuca rubra* var. *arenaria*. c. *Poa glauca*. d. *Puccinellia poacea*. e. *Arctophila fulva*. (2/5)

9. **P. vaginata** (Lge.) Fern. & Weath. var. **paradoxa** Th. Sør.—Differs from the main species as follows: Culms stout, commonly prostrate, upper leaf-sheath less inflated. Panicle branches stiffly erect or spreading, sometimes fascicled; spikelets appressed, often subsessile, clustered; glumes acute or acutish, distinctly nerved, less translucent.

In similar places as the species.

General distribution: Endemic of the eastern N. American Arctic. FIG. 9,l,m. MAP 52 (triangles).

15. FESTUCA L. Fescue

Perennial caespitose or stoloniferous grasses with narrow, involute leaves and variously shaped panicle; glumes somewhat unequal; the lemmas rounded on the back, terminating in a short awn.

Caespitose; anthers less than 1.0 mm. in length	
Panicle narrow, spike-like; culm smooth and wiry	1. *F. brachyphylla*
Panicle ovoid; culm minutely hirsute above	2. *F. baffinensis*
Stoloniferous; anthers 1.5 mm. or over	3. *F. rubra* var. *arenaria*

1. **F. brachyphylla** Schultes—Densely tufted; the smooth, wiry culms 10 to 20 cm. high, usually much longer than the stiff, bristle-like leaves. Panicle narrow and spike-like, sometimes viviparous (f. *vivipara*); anthers about 0.75 mm. long.

Ubiquitous in exposed sandy, gravelly, or rocky places.

General distribution: Circumpolar, wide-ranging, arctic-alpine. FIG. 11,d. MAP 53.

2. **F. baffinensis** Polunin—Similar but with somewhat longer and softer leaves that in length almost equal the culm, which is velvety hirsute in the upper half with short, stiff, and often curved hairs, visible only under a lens. Panicle narrowly ovoid, often one-sided and usually densely suffused with purple; anthers, 0.4 to 0.6 mm. long.

On calcareous soil in sandy and gravelly places.

General distribution: N. American, high-arctic–alpine. FIG. 11,c. MAP 54.

F. vivipara (L.) Sm.—Similar in habit to Nos. 1 and 2, but the panicle always proliferous, the flowers represented by leafy buds.

Moist, turfy places. Eastern N. Am. Arctic; Eurasia.

3. **F. rubra** L. var. **arenaria** (Osb.) Fr.—Turf-forming grass with soft, narrowly involute leaves, and smooth, erect or ascending culms. Panicle lax, usually somewhat drooping. Spikelets 4- to many-flowered; glumes narrow, acuminate, glabrous, or slightly pilose at the apex and margins; lemmas densely villous.

Rare in our area where it is generally found in sheltered, sandy places, often near the seashore.

General distribution: Circumpolar, wide-ranging, low-arctic. FIG. 12,a,b. MAP 55.

BROMUS L. Brome-grass

B. Pumpellianus Scribn. var. **arcticus** (Shear) Porsild—A tall grass with broad, flat, and somewhat rough, more or less hairy leaves, and a panicle 5 to 10 cm. long, of large 4- to 9-flowered spikelets on slender somewhat flexuous branches.

In sandy places by lake shores, river-banks, or in dunes by the seashore. W. Arctic; Rocky Mts., east to L. Superior.

16. AGROPYRON Gaertn. Wheatgrass

A. latiglume (Scribn. & Sm.) Rydb.: *Roegneria borealis* (Turcz.) Nevski—Tufted coarse grass with broad, flat, rough leaves and stout, smooth culms, 20 to 35 cm. high. Spike dense; spikelets 3- to 5-flowered, generally suffused with violet. Lemmas glabrous or pubescent, acuminate or awned. In our area represented by the var. *pilosiglume* Hult. (*A. violaceum* var. *hyperarcticum* Polunin), which is distinguished by pubescent glumes.

Common on well-drained, alluvial, calcareous, sandy or clay soils of the Paleozoic series.

General distribution: North American, wide-ranging, arctic. FIG. 13,b. MAP 56.

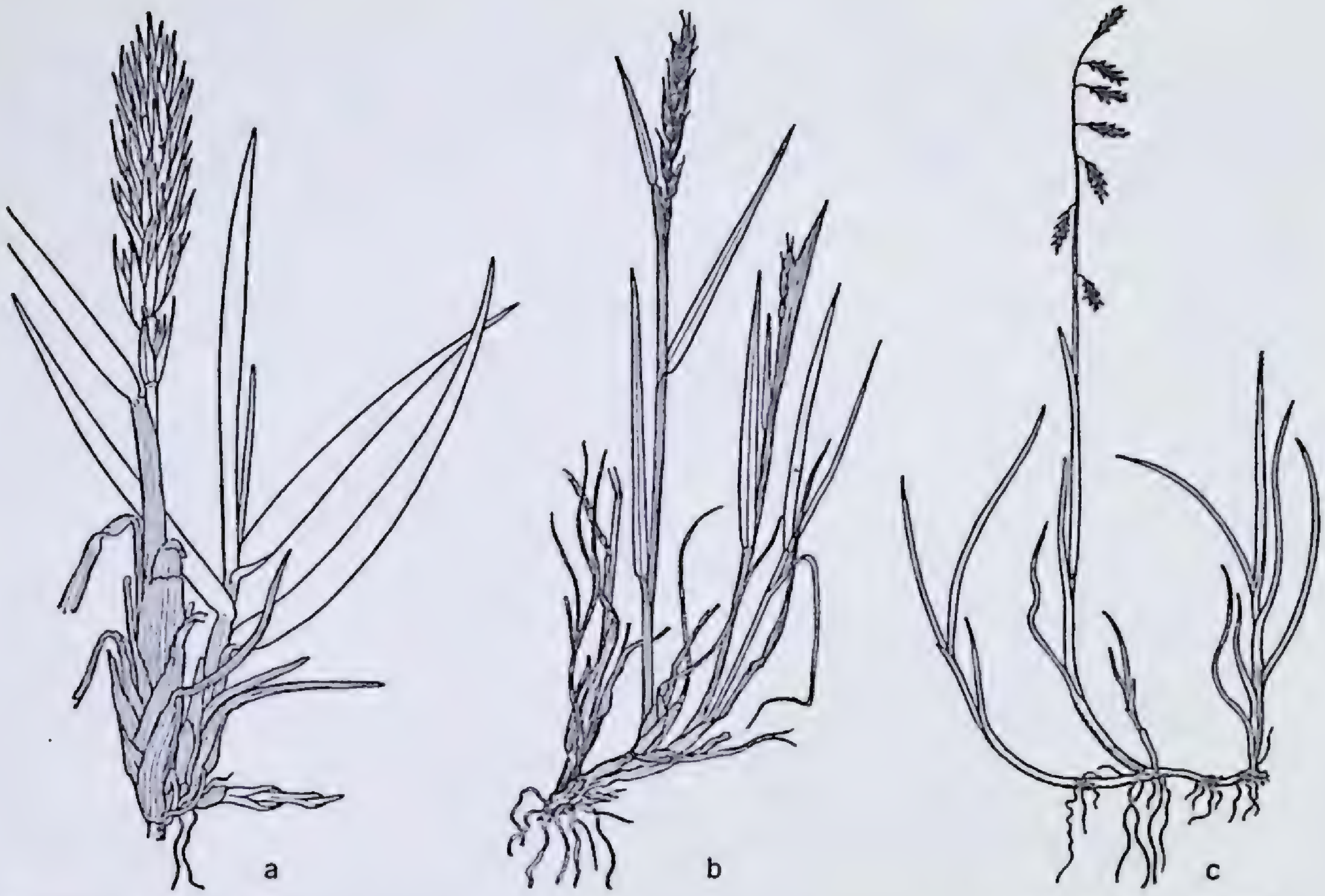

FIGURE 13. a. *Elymus arenarius* ssp. *mollis* (young specimen). b. *Agropyron latiglume* var. *pilosiglume* (young specimen). c. *Pleuropogon Sabinei*. (2/5).

17. ELYMUS L. Lyme-Grass

E. arenarius L. ssp. **mollis** (Trin.) Hult.—A coarse, stoloniferous grass with glaucous, broad, flat leaves, and stout culms, 15 to 100 cm. high, which are soft villous in the upper part. Spike 8 to 15 cm. long; glumes and lemmas soft villous.

Dunes and sandy places near the sea or sometimes by lake shores.

General distribution: Circumpolar, littoral, low-arctic. FIG. 13,a. MAP 57.

6. CYPERACEAE Sedge Family

Perennial grass- or rush-like plants with solid, 3-angled or terete culms; leaves 3-ranked with closed sheaths and narrow, linear blades. Flowers perfect or unisexual, arranged in spikelets; perianth sack-like, composed of bristles, or lacking; stamens mostly 3, their filaments slender, anther 2-celled; ovary superior, 1-celled, stigmas 2 to 3; fruit an achene.

- Flowers mostly perfect; perianth represented by bristles
  - Bristles much elongated in fruit, silky — 1. ERIOPHORUM
  - Bristles short, inconspicuous or lacking
    - Base of style enlarged, bulbiform, separated from the summit of the achene — 2. ELEOCHARIS
    - Base of style not enlarged, continuous with the achene — 3. SCIRPUS
- Flowers unisexual, the staminate and pistillate in the same or different spikelets
  - Achene enclosed in a spathe which is open in one side — 4. KOBRESIA
  - Achene completely enclosed in a bottle-shaped sack (perigynium) — 5. CAREX

1. ERIOPHORUM L. Cotton Grass

Caespitose or stoloniferous bog or marsh plants with smooth obtusely triangular or terete culms terminating in from one to several spikelets; perianth bristles long and silky in fruit.

Spikelets several, drooping, subtended by a foliaceous bract	
Peduncles smooth	1. *E. angustifolium*
Peduncles, scabrous	2. *E. triste*
Spikelets solitary	
Plant stoloniferous, culms mostly solitary	
Anthers minute, 1 mm. long or less; heads depressed, globose	3. *E. Scheuchzeri*
Anthers 1.5 mm. long or more; heads oblong	4. *E. russeolum* var. *albidum*
Plant caespitose, forming tufts or tussocks	
Spathes and scales black without conspicuous pale margins, not reflexed	
Low species with silky-white bristles and anthers 1 mm. long or less	5. *E. callitrix*
Tall species with dull-white or yellowish bristles and 1–2 mm. long anthers	6. *E. brachyantherum*
Spathes and scales with pale margins, reflexed and spreading in age; anthers 2–3 mm. long	
Heads oblong, scales and spathes pale lead-coloured	7. *E. vaginatum*
Heads depressed globose, scales and spathes with dark centre	8. *E. vaginatum* ssp. *spissum*

1. **E. angustifolium** Honck.—Culms 20 to 40 cm. high; leaves flat, keeled; spikelets several, nodding.

In wet bogs or in water by the edge of ponds where it often forms pure stands.

General distribution: Circumpolar, low-arctic. FIG. 14,a,b. MAP 58.

2. **E. triste** (Th. Fr.) Hădac & Löve —Similar, but generally of lower stature with the peduncles of the spikelets distinctly scabrous and with black spathes and scales. In mineral soil, often in open clay spots in tundra and by the edge of snowbeds, never in water by edge of ponds.

General distribution: Amphi-Atlantic, high-arctic. MAP 59.

3. **E. Scheuchzeri** Hoppe—Culms 15 to 30 cm. high, mostly solitary, soft and sparingly leafy at the base, from a thin, creeping rootstock; leaves strongly involute.

Common in wet meadows and in shallow water by the edge of ponds, where it often forms pure stands.

General distribution: Circumpolar, low-arctic. FIG. 14,h. MAP 60.

4. **E. russeolum** Fr. var. **albidum** Nyl.; *E. russeolum* Fr. var. *leucothrix* (Blomgr.) Hult.—Similar, but easily distinguished by its oblong fruiting head and longer anthers.

In mud by shallow ponds.

General distribution: Circumpolar, low-arctic. FIG. 14,f. MAP 61.

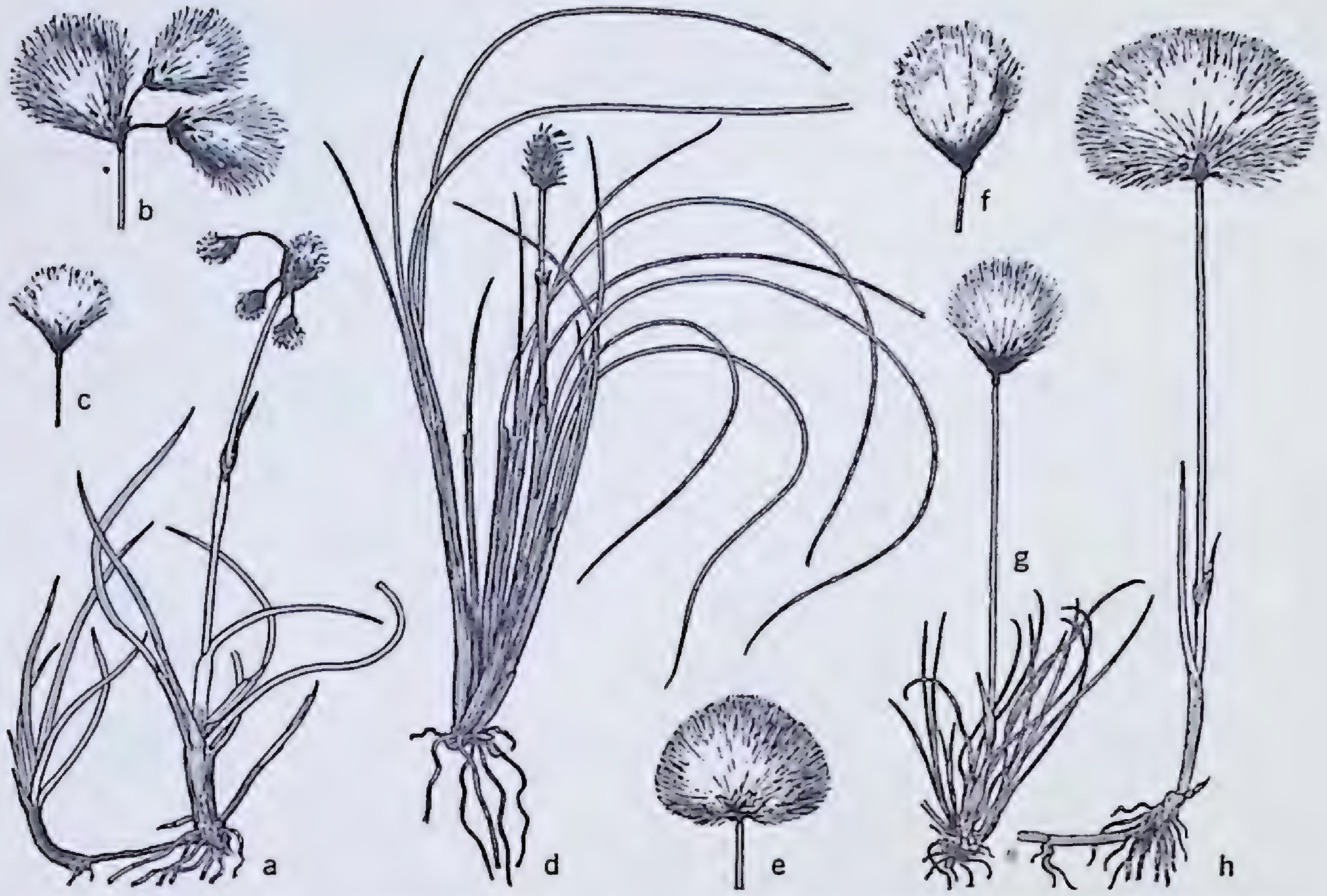

FIGURE 14. a, b. *Eriophorum angustifolium* c. *E. brachyantherum.* d, e. *E. vaginatum* ssp. *spissum.* f. *E. russeolum* var. *albidum* g. *E. callitrix.* h. *E. Scheuchzeri.* (2/5)

5. E. **callitrix** Cham.—Forming small, solitary, compact tufts. Culms slender, 10 to 20 cm. high, the upper sheath usually below the middle of the culm. Bristles pure white with a silky sheen.

In calcareous, turfy places.

General distribution: N. American radiant, of arctic-subarctic range. FIG. 14,g. MAP 62.

6. E. **brachyantherum** Trautv.; *E. opacum* (Björnstr.) Fern.—Loosely tufted, with slender, terete culms 20 to 30 cm. long. Sheaths remote, the uppermost above the middle of the culm. Heads small with lead-coloured scales; the bristles dull white or yellowish.

A non-arctic, lowland muskeg species, which rarely extends far beyond the tree-line.

General distribution: Circumpolar, low-arctic. FIG. 14,c. MAP 63.

7. E. **vaginatum** L.—Forming large and compact tussocks. Culms stout, 20 to 40 cm. high, the uppermost sheath usually below the middle of the culm. Anthers 2.5 to 3.0 mm. long.

A western species common in peaty soil, east of the 100th meridian gradually passing into ssp. *spissum.*

General distribution: Subarctic Eurasia and N. America. MAP 64.

8. **E. vaginatum** L. ssp. **spissum** (Fern.) Hult.—Similar to No. 7 and distinguished chiefly by its depressed, globose fruiting heads and slightly shorter, about 2.0 mm. long, anthers.

An eastern race common in peaty tundra, mainly in the eastern part of our area.

General distribution: Eastern N. America, low-arctic. Fig. 14,d,e. Map 65.

2. Eleocharis R. Br.

E. acicularis L.—A tiny aquatic plant with bristle-like, 2.5 cm. high, filiform culms, from a thin, creeping rootstock. Spike terminal.

In the Arctic nearly always sterile and submerged (f. *submersa* Hj. Nilss.), forming soft, green carpets on soft mud on the bottom of shallow ponds of soft, non-alkaline water.

General distribution: Circumpolar, wide-ranging. Fig. 15,f. Map 66.

3. Scirpus L.

S. caespitosus L. ssp. **austriacus** (Pallas) Asch. & Graebn.—Low and very densely caespitose, with wiry, terete, smooth, erect-ascending culms, 10 to 15 cm. high; the bases of culms firmly encased in sheaths which persist for many years; the uppermost bearing a short, callous-tipped, bract-like blade. Spikelet terminal 3 to 5 mm. long.

Forming tussocks in peaty soil, in springy tundra, and along brooks; in the North perhaps always in calcareous places.

General distribution: Circumpolar, low-arctic. Fig. 15,g. Map 67.

4. Kobresia Willd.

Tufted, sedge-like plants with short, spike-like inflorescence, of the general habit and appearance of certain species of the genus *Carex*, but readily distinguished by the achene not being enclosed in a perigynium.

Spikelets consisting of one staminate and one pistillate flower	
Inflorescence spike-like, linear, cylindrical, consisting of numerous small 2-flowered spikelets	1. *K. myosuroides*
Inflorescence oblong to ovoid, consisting of several spikes each composed of 2-flowered spikelets	2. *K. hyperborea*
Spikelets unisexual, 1-flowered, the upper ones staminate, the lower pistillate	3. *K. simpliciuscula*

1. **K. myosuroides** (Vill.) Fiori & Paol.; *K. Bellardii* (All.) Degel.—Densely tufted, with slender, more or less terete culms, 10 to 40 cm. high; old sheaths long-persistent, densely packed, fibrillose, brown; leaves numerous, somewhat flexuous, narrow and convolute, shorter than the culms. Inflorescence 10 to 15 mm. long and 2 to 2.5 mm. wide.

Although not confined to the area of Palæozoic rocks, the species is a pronounced calciphile, preferring dry, sandy heath and windswept ridges.

General distribution: Circumpolar, wide-ranging. Fig. 15,b,c. Map 68.

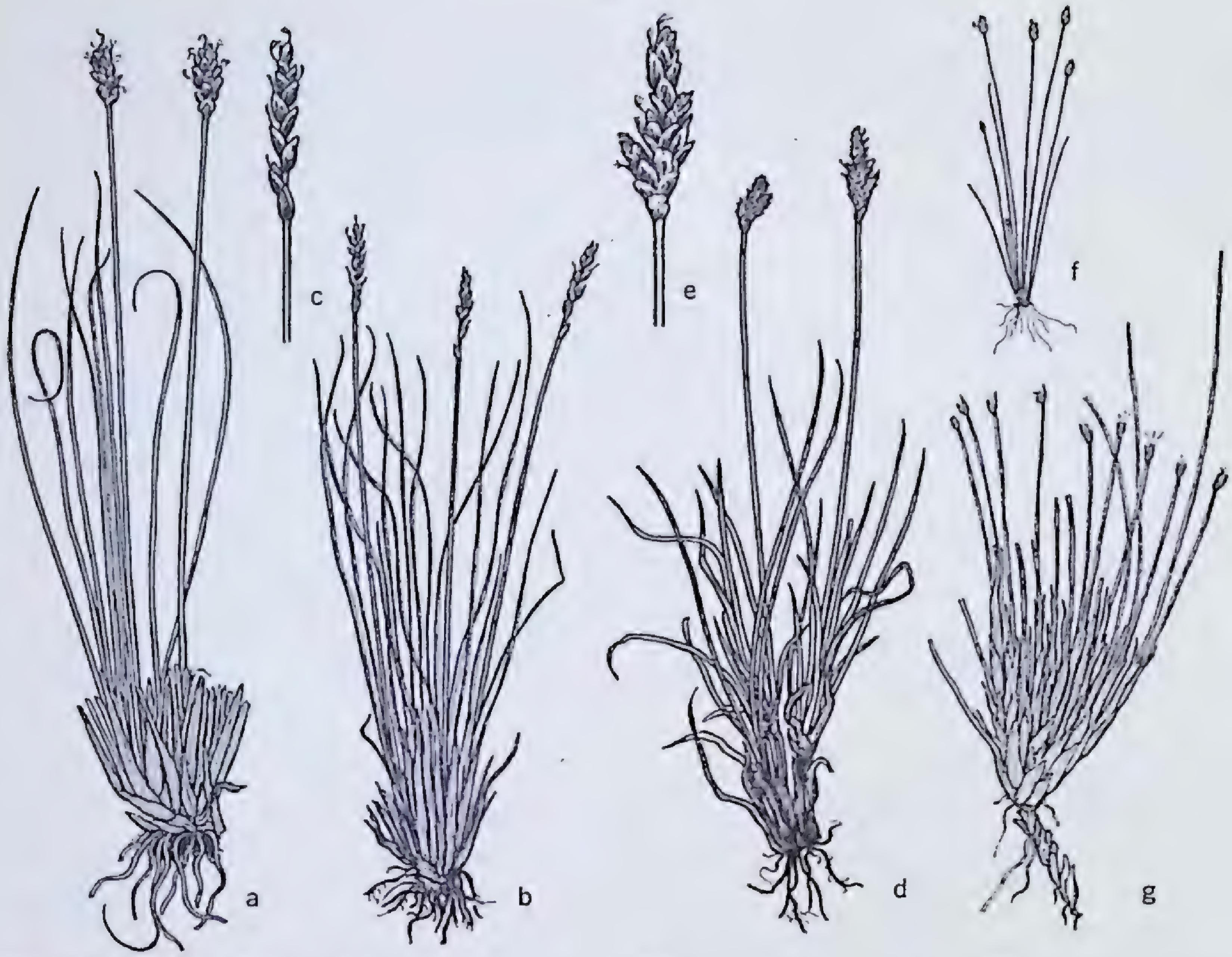

FIGURE 15. a. *Kobresia hyperborea.* b, c. *K. myosuroides.* d, e. *K. simpliciuscula.* f. *Eleocharis acicularis.* g. *Scirpus caespitosus* ssp. *austriacus.* (1/2; c, e. 1/1)

2. **K. hyperborea** Porsild—Densely caespitose with a short, stout, ascending rootstock. Culms stout, 12 to 35 cm. high, at maturity much longer than the narrow leaves. Inflorescence spike-like, 10 to 18 mm. long, 5 to 8 mm. wide.

In rather dry, peaty tundra.

General distribution: Endemic of arctic N.W. America. The type came from Mackenzie Delta. FIG. 15,a. MAP 69.

3. **K. simpliciuscula** (Wahlenb.) Mack.—Densely caespitose. Culms 10 to 30 cm. high, at maturity much longer than the strongly convolute, somewhat flexuous leaves. Spike, oblong-ovoid, 15 to 25 mm. long, 5 to 8 mm. wide; composed of several spikelets, in tall specimens the lowermost spikelets somewhat remote.

In calcareous, gravelly places.

General distribution: Circumpolar, arctic-alpine. FIG. 15,d,e. MAP 70.

5. CAREX L. Sedge

Perennial monoecious or rarely dioecious grasslike plants with mostly triangular culms bearing an inflorescence composed of one to several spikes, which may be wholly staminate, pistillate, or composed of both staminate and pistillate flowers. The flowers lack floral envelopes and are borne in the axil of a scale-like bract; the staminate flowers consist of three stamens and the pistillate of a single bifid or trifid style emerging from the neck of the bottle-shaped sack (perigynium), which envelopes the achene.

- a. Spike solitary (Primocarex)
  - b. Stigmas 2
    - c. Densely caespitose; monoecious
      - d. Spike staminate at the base; dwarf littoral species 7. *C. ursina*
      - d. Spike staminate at summit; not littoral
        - e. Spike globose; perigynia broader than scales 2. *C. arctogena*
        - e. Spike ovate; perigynia narrower than scales 1. *C. nardina* var. *atriceps*
    - c. Stoloniferous, usually dioecious but not infrequently with a few staminate flowers at the summit of the pistillate spike 3. *C. gynocrates*
  - b. Stigmas 3
    - f. Plant strictly dioecious; perigynia hairy 4. C. *scirpoidea*
    - f. Plant monoecious; perigynia not hairy
      - g. Pistillate scales caducous perigynia erect or spreading; dwarf species with filiform, terete culms and leaves 6. *C. microglochin*
      - g. Pistillate scales not caducous; culms triangular, leaves flat, somewhat curled 5. *C. rupestris*

- a. Spikes compound
  - h. Spikelets sessile, bisexual (Vignea)
    - i. Spikelets with pistillate flowers at the base
      - j. Perigynia strongly nerved with a distinct wing-margin 9. *C. chordorrhiza*
      - j. Perigynia almost nerveless, shiny, somewhat inflated and wingless 8. *C. maritima*
    - i. Spikelets with staminate flowers at the base
      - k. Densely caespitose, littoral species with distinctly nerved perigynia 12. *C. glareosa* var. *amphigena*
      - k. Loosely caespitose, non-littoral species, with nerveless or faintly nerved perigynia
        - l. Perigynia lanceolate, distinctly beaked 10. *C. Lachenalii*
        - l. Perigynia ellipsoid, merely conical 11. *C. amblyorhyncha*
  - h. Spikelets pedunculate, usually unisexual but occasionally bisexual (Eucarex)
    - m. Stigmas 2
      - n. Terminal spikelet staminate at base 13. *C. bicolor*
      - n. Terminal spikelet wholly staminate
        - o. Perigynia with a long beak
          - p. Staminate spikelets usually 2, the lowermost pistillate spikelets long-peduncled and drooping (Western species) 28. *C. physocarpa*
          - p. Staminate spikelet usually solitary; the pistillate short-peduncled, rarely drooping (Eastern species) 29. *C. saxatilis*
        - o. Perigynia beakless, or with a very short beak
          - q. Bract of the lowermost spikelet shorter than the inflorescence and scarcely leaf-like
            - r. Densely caespitose; leaves narrow (Western species) 15. *C. lugens*
            - r. Stoloniferous; leaves broad and flat (Eastern species) 14. *C. Bigelowii*
          - q. Bract of the lowermost spikelet leaf-like, usually as long as the inflorescence
            - s. Coarse bog plant with broad, flat leaves 16. *C. stans*
            - s. Turf-forming, littoral dwarf species 17. *C. subspathacea*

m. Stigmas 3
  t. Terminal spikelet staminate at the base; plant densely caespitose with short flat leaves
    u. Inflorescence head-like, spikelets erect or spreading, sessile or short-peduncled 18. *C. norvegica*
    u. Inflorescence not head-like, lateral spikelets on capillary peduncles 25. *C. misandra*
  t. Terminal spikelet staminate throughout, or sometimes with a few pistillate flowers at the base
    v. Spikelets short-peduncled, erect or spreading, more or less aggregated in a head-like inflorescence; lowermost bract scale-like
      w. Staminate spikelet inconspicuous and often concealed between the pistillate spikelets; medium sized plants 19. *C. holostoma*
      w. Staminate spikelet conspicuous; the lowermost bract short and scale-like; dwarf species
        x. Caespitose; lowermost bract non-sheathing 21. *C. glacialis*
        x. Stoloniferous; lowermost bract sheathing 20. *C. supina* ssp. *spaniocarpa*
    v. Spikelets usually long-peduncled, erect, or drooping; if short peduncled the inflorescence not head-like
        y. Lowermost bract scale-like 22. *C. rariflora*
        y. Lowermost bract leaf-like
          z. Caespitose
            aa. Pistillate spikelets 2–3, dark brown or black 24. *C. atrofusca*
            aa. Pistillate spikelets 3–6, chestnut brown, on capillary peduncles 27. *C. capillaris*
          z. Stoloniferous
            bb. Pistillate spikelets usually 2, lax-flowered 23. *C. vaginata*
            bb. Pistillate spikelets usually 3 or more
              cc. Inflorescence dense; pistillate spikelets subsessile, erect; perigynia somewhat inflated, purplish-black; leaves broad and flat 30. *C. membranacea*
              cc. Inflorescence open, the lowermost spikelets distant and long-peduncled; leaves narrow and somewhat involute, long-attenuate and somewhat curled 26. *C. petricosa*

Primocarex

1. **C. nardina** Fr.—Densely caespitose, with persistent brown sheaths, forming small, hard and compact tufts. Culms 10 to 20 cm. high, equalling or slightly longer than the narrow, trigonous, often somewhat curved leaves. Spike solitary, ovoid, about 10 mm. long and 5 to 6 mm. wide. Staminate part inconspicuous. Pistillate scales dark brown with an inconspicuous pale midvein, broader than the lanceolate, distinctly stipitate perigynia. Stigmas 2.

In the Canadian Arctic represented by the eastern race, var. *atriceps* Kük., which is distinguished from the main species by its taller growth and less curved culms and leaves.

Calcareous sand and gravel, dry, grassy or rocky slopes.

General distribution: Amphi-Atlantic, low-arctic. Figs. 17,a; $16,_1$. Map 71.

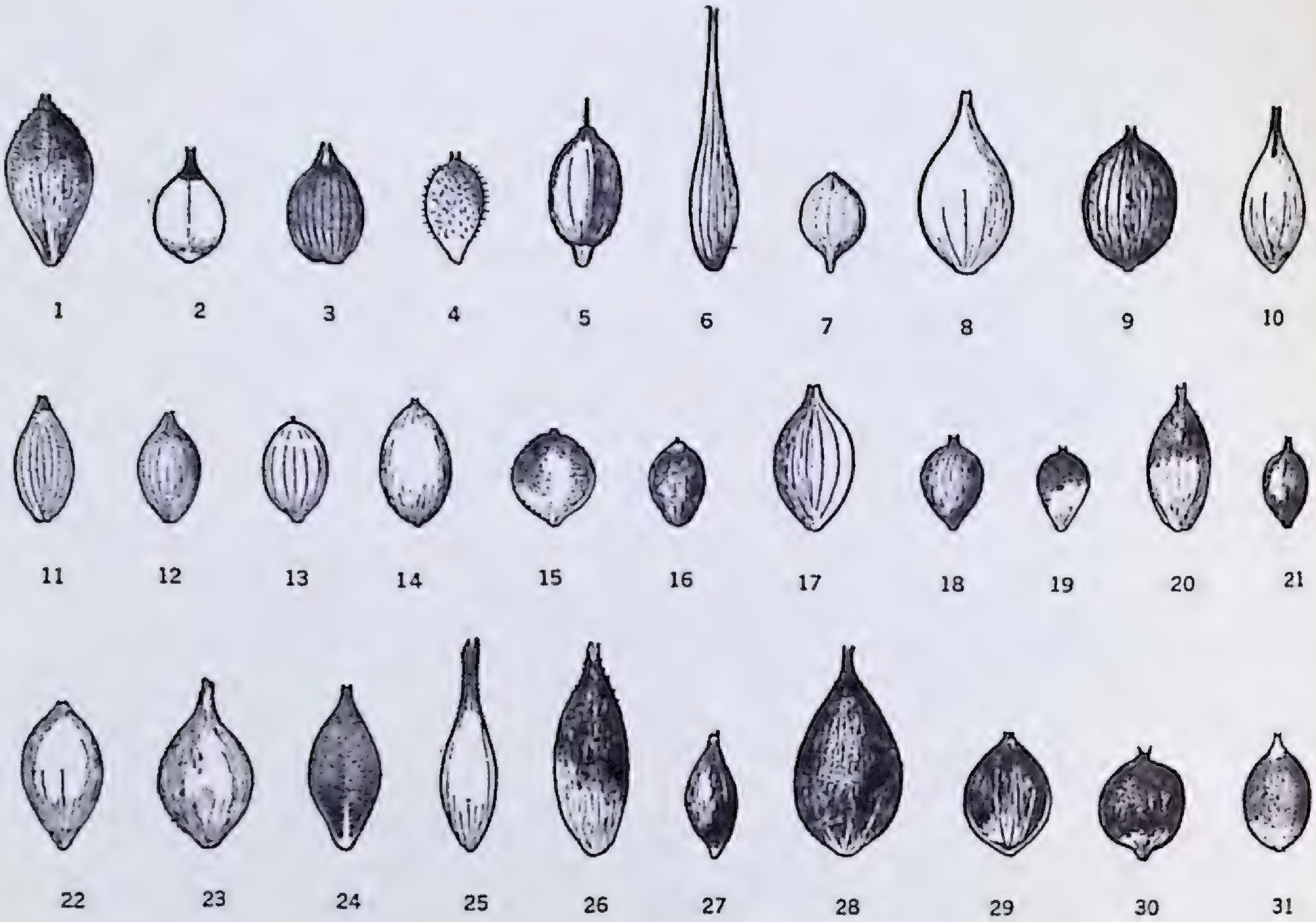

FIGURE 16. Perigynia of *Carex*. 1. *nardina* var. *atriceps*. 2. *arctogena*. 3. *gynocrates*. 4. *scirpoidea*. 5. *rupestris*. 6. *microglochin*. 7. *ursina*. 8. *maritima*. 9. *chordorrhiza*. 10. *Lachenalii*. 11. *amblyorhyncha*. 12. *glareosa*. 13. *bicolor*. 14. *Bigelowii*. 15. *lugens*. 16. *stans*. 17. *subspathacea*. 18. *norvegica*. 19. *holostoma*. 20. *supina* ssp. *spaniocarpa*. 21. *glacialis*. 22. *rariflora*. 23. *vaginata*. 24. *atrofusca*. 25. *misandra*. 26. *petricosa*. 27. *capillaris*. 28. *physocarpa*. 29. *saxatilis*. 30. *membranacea*. 31. *saxatilis* var. *miliaris*. (4/1)

2. **C. arctogena** H. Smith—Densely caespitose with persistent, firm, greyish-brown sheaths. Culms 10 to 20 cm. long, longer than the narrow, trigonous channelled leaves. Spikes solitary, ovate-globose, 6 to 8 mm. long and 4 to 5 mm. wide, the staminate part conspicuous, forming a small projecting point at the summit. Perigynia globose with a short beak about 1.9 mm. long and 1.5 mm. wide. Stigmas 2.

Moist, peaty soil; not a pronounced calcicole. An arctic-alpine species which is closely related to the more widely distributed *C. capitata* Sol., from which it differs by consistently smaller and darker brown heads and smaller perigynia.

General distribution: Amphi-Atlantic, low-arctic. FIGS. 18,b,c; 16,$_2$. MAP 72.

3. **C. gynocrates** Wormskj.—Stoloniferous, culms filiform 5 to 15 cm. high, longer than the narrow, bristle-like leaves. Spike solitary, either staminate and linear, pistillate cylindric or staminate above and pistillate in the lower part. Perigynia at first ascending, spreading when mature, plump, dark brown, and somewhat shiny. Stigmas 2.

In springy, wet places, in wet sphagnum, generally on calcareous soil.

General distribution: Circumpolar, low-arctic. FIGS. 17,d; 16,3. MAP 73.

4. **C. scirpoidea** Michx.—Loosely caespitose with stout, black, scaly rootstocks. Culms stiff, sharply trigonous, 15 to 25 cm. high, much longer than the flat, 3 to 4 mm. broad, scabrous leaves. Spikes solitary; those of the male plant obovate; those of the female plant linear-cylindrical, 20 to 30 mm. long and 3 to 5 mm. wide, the scales black with pale hyaline margins; perigynia hairy, with a short beak. Stigmas 3.

Dry, turfy places; usually on calcareous soil.

General distribution: Wide-ranging, N. American radiant. FIGS. 17,e,f; 16,4. MAP 74.

5. **C. rupestris** All.—Tufted, with a slender, cord-like rootstock. Culms rather stout, scabrous, 8 to 15 cm. high, barely longer than the scabrous, flat, and somewhat curved leaves. Spike solitary, cylindrical, 6 to 20 mm. long, mostly staminate, with a few pistillate flowers near the base. Pistillate scale obtuse, dark brown, broadly hyaline margined, broader and longer than the oblanceolate, obtusely trigonous, and faintly nerved, dull, castaneous, 3 to 3.5 mm. long perigynia. Stigmas 3.

In dry, turfy places in tundra, on gravelly ridges and rocky ledges. A pronounced calcicole, often associated with *Dryas integrifolia*.

General distribution: Circumpolar, arctic-alpine. FIGS. 18,f,g; 16,5. MAP 75.

C. obtusata Liljeb.—Similar to No. 5 but at once distinguished by its narrower leaves, more slender culm, purplish-black sheaths, and by its shiny, dark brown perigynia.

Calcareous, gravelly places. Western arctic-alpine. Mackenzie, Alaska, Yukon, and Rocky Mts. Eurasia.

6. **C. microglochin** Wahlenb.—Loosely tufted with short stolons and short, strongly involute leaves; culms singly or few together, filiform smooth, 4 to 15 cm. high. Spike solitary, few-flowered, staminate at the summit, pistillate below. At the time of flowering, the perigynia are erect but soon become reflexed. Pistillate scales early deciduous; the 6 mm. long, straw-coloured perigynia subulate-lanceolate, tapering to a long beak from which the stiff, bristle-like rachilla projects beyond the 3 stigmas.

In wet, springy places on calcareous soil.

General distribution: Circumpolar, low-arctic. FIG. 18,a and 16,6. MAP 76.

7. **C. ursina** Dew.—Densely caespitose dwarf species; the often somewhat ascending culms 4 to 6 cm. long, barely emerging above the tufted, involute leaves. Spike solitary, globose, 4 to 5 mm. long and 4 mm. wide, staminate at the base; pistillate scales shorter than the broadly ovate, faintly nerved, nearly beakless perigynia. Stigmas 2.

A pronounced littoral species of sheltered sea and lagoon shores, subject to flood by high tide.

General distribution: Circumpolar, high-arctic. FIGS. 18,e; 16,7. MAP 77.

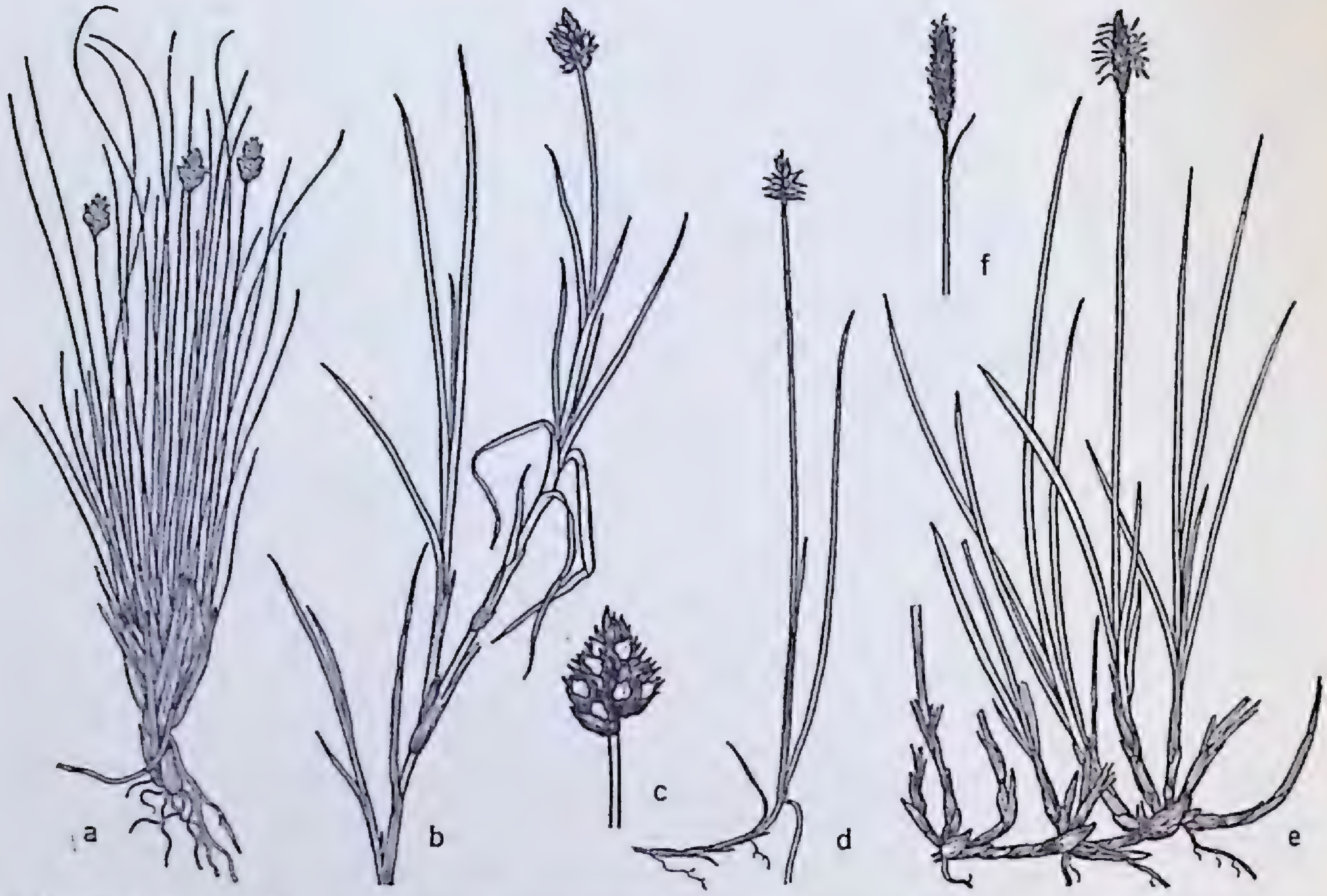

FIGURE 17. a. *Carex nardina* var. *atriceps*. b, c. *C. chordorrhiza*. d. *C. gynocrates*. e, f. *C. scirpoidea* (e. ♂, f. ♀). (1/2; c. 1/1)

VIGNEA

8. **Carex maritima** Gunn.; *C. incurva* Lightf.—Dwarf species with creeping rootstock and low, 5 to 15 cm. high, usually curved culms that barely overtop the leaves. Spike globose or ovoid, 8 to 14 mm. in diameter, composed of 3 to 5 spikelets which are staminate at the summit. Pistillate scales brown, ovate and obtuse, thin, with a broad, pale margin. The mature perigynia are membranaceous, chestnut-brown, somewhat inflated, and at length divergent or spreading. Stigmas 2.

A littoral species generally confined to sandy, gravelly, or turfy places along the seacoast, but in the Western Arctic (Alaska, Yukon, Mackenzie, and the Western Archipelago) not infrequently growing at some distance inland and at considerable elevation above sea-level. This inland plant may be referable to *C. Langeana* Fern. of Greenland and Newfoundland, distinguished from *C. maritima* by its ellipsoid-cylindric head, short anthers, and scabrous-tipped leaves, but is distinct from *C. incurviformis* Mack. of the Canadian Rocky Mts., in which the perigynia are conspicuously many-nerved and neither membranaceous nor inflated.

General distribution: Circumpolar, arctic. FIGS. 18,d; 16,$_8$. MAP 78.

9. **C. chordorrhiza** Ehrh.—Tufted, with widely trailing and ascending, leafy stems, up to one metre long. Culms smooth, 10 to 20 cm. long, equalling or slightly longer than the rather broad, strongly keeled leaves. Spikelets 3 to 8, staminate at the summit and aggregated into an ovoid spike; pistillate scales broader than the ovoid, short-beaked, and strongly nerved perigynia. Stigmas 2.

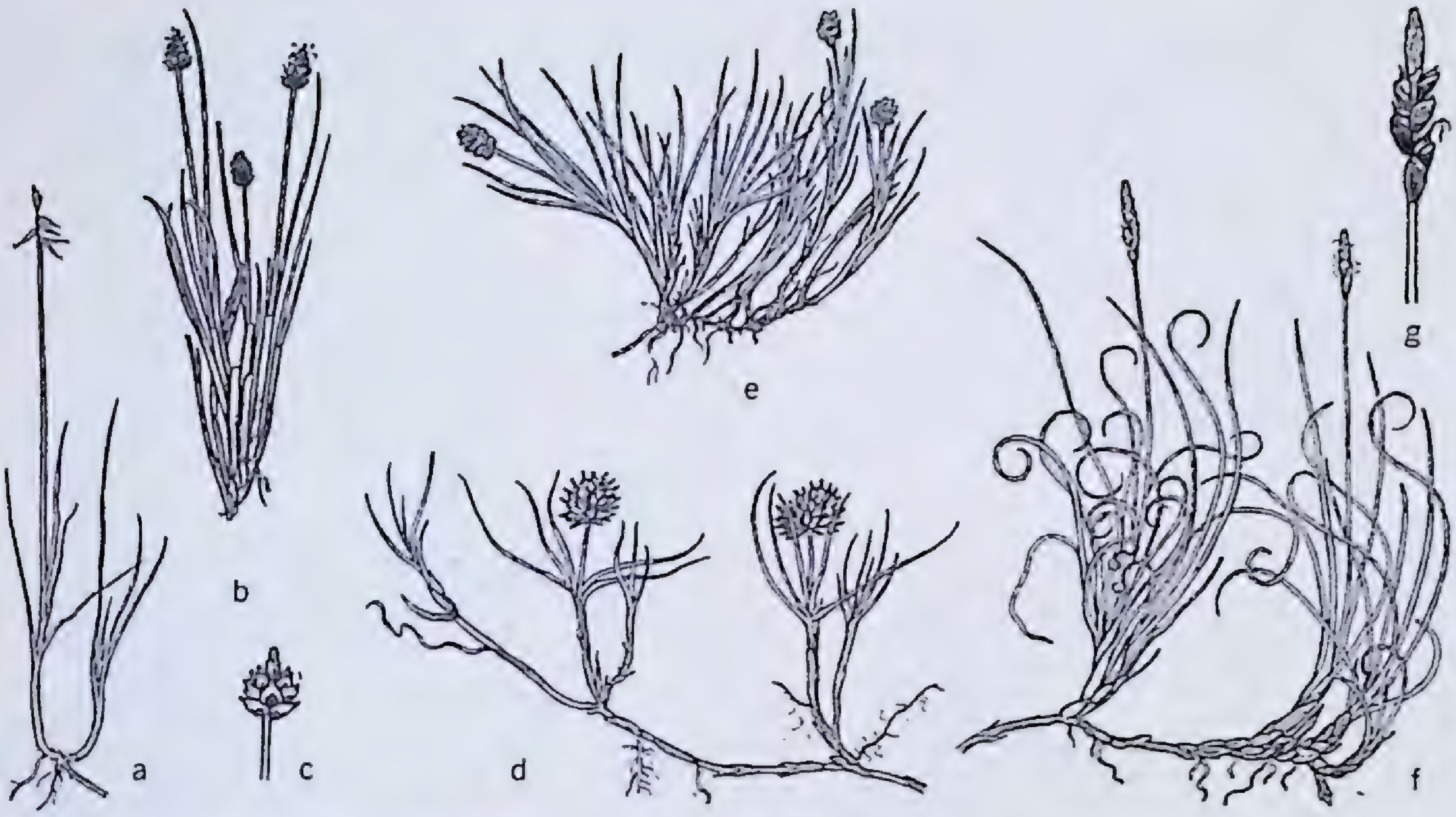

FIGURE 18. a. *Carex microglochin.* b, c. *C. arctogena.* d. *C. maritima.* e. *C. ursina.* f, g. *C. rupestris.* (1/2; c, g. 1/1)

Occasional to rare in wet sedge-bog tundra.

General distribution: Circumpolar, low-arctic. FIGS. 17,b,c; and 16,$_{9}$. MAP 79.

C. macloviana d'Urv.—Densely caespitose, with stiff, obtuse-angled, somewhat scabrous culms, and short, flat, broad leaves. Spikelets 5 to 7, dark brown, crowded into an ovoid head.

Grassy, south-facing slopes. Subarctic-alpine, E. and W. North America, Greenland, Eurasia, S. America.

10. **C. Lachenalii** Schk.—Loosely caespitose, with stiff culms, 15 to 25 cm. high, and flat, rather short leaves. Spikelets 3 to 4, in an oblong spike 1 to 2 cm. long, the terminal staminate at the base, the lowermost often somewhat distant. Pistillate scales brown with a pale midvein, shorter than the smooth or faintly scabrous margined, lanceolate, nerveless, rather abruptly beaked perigynia that turn a rich, golden brown when mature. Stigmas 2.

Wet sand and in turfy places by brooks and lake shores. Not littoral; a subarctic, boreal species that barely enters our area.

General distribution: Circumpolar, low-arctic. FIGS. 19,b,c; 16,$_{10}$. MAP 80.

11. **C. amblyorhyncha** Krecz.—Similar in general growth form and appearance but at once distinguished by the elliptic-ovate, yellowish-brown, densely punctate, many-nerved, conical, and very short-beaked, bidentate perigynia. Stigmas 2.

A truly arctic species growing in wet, mossy places in bogs.

General distribution: Circumpolar, arctic. FIGS. 19,a; 16,$_{11}$. MAP 81.

12. **C. glareosa** Wahlenb. var. **amphigena** Fern.—Densely caespitose with slender, ascending, and generally somewhat flexuous culms, slightly longer than the narrow, glaucous leaves. Spikelets usually 3, close together, ovoid, the terminal club-shaped, staminate at the base. Scales brown with a paler midvein about as long as the ovate, greyish-brown, short-beaked, many-nerved perigynia. Stigmas 2.

A seashore plant which forms dense, compact, flat tussock on sand and clay beaches subject to spring floods. Often a dominant species around the nesting grounds of sea birds.

General distribution: Circumpolar, arctic. FIGS 19, e; 16,$_{12}$. MAP 82.

EUCAREX (*distigmatae*)

13. **C. bicolor** All.—Loosely caespitose. The culms weak and slender, often recurved or spreading, 5 to 15 cm. long, slightly longer than the flat, pale glaucous leaves. Spikelets usually 3, oval or short cylindrical, the terminal staminate at the base, the lower short-peduncled; the bract scarcely foliaceous, equalling or slightly longer than the inflorescence. Pistillate scales reddish-brown, with a pale midvein, shorter than the elliptic white or pale green, nerveless or very finely nerved, papillose and almost beakless perigynia. Stigmas 2.

In wet sand by brooks and lake shores.

General distribution: Circumpolar, low-arctic. FIGS. 19,h; 16,$_{13}$. MAP 83.

C. rufina Drej.—Forming rather dense, flat tussocks of soft, dark-green leaves, among which the culms are usually hidden. Spikelets 3 to 4, densely clustered, the terminal male with female flowers at the base.

Wet, stony places, often by the edge of ponds or on snowbeds.

Scandinavia, E. and W. Greenland; in N. America thus far known from a few stations in Keewatin but probably occurring in S. Baffin Island and Labrador.

14. **C. Bigelowii** Torr.—A coarse, stoloniferous sedge with stout, scaly stolons terminating in leafy shoots. Culms stiff, smooth, and sharply trigonous, 10 to 25 cm. high, slightly longer than the flat, revolute-margined, strongly ribbed but not septate, glaucous, and usually somewhat curved leaves. Terminal spikelet staminate, linear, the lower 2, or less commonly 3, pistillate; occasionally with a few staminate flowers at the summit, short cylindrical, erect, sessile or short-peduncled. Pistillate scales short, obtuse, purplish-black with a pale margin and greenish midvein, equalling or shorter than the broadly elliptic-lanceolate, greenish or pale brown blotched, smooth, nerveless. short-beaked perigynia. Stigmas 2.

A very variable species. The typical plant normally is found in rather dry, turfy places; in wet places it becomes taller, occasionally with longer and more lax-flowered pistillate spikelets. An extreme or possibly distinct race is *C. anguillata* Drej. [f. *anguillata* (Drej.) Fern.] with linear, long-peduncled pistillate spikelets, of which the lowermost may even rise from the base of the culm.

General distribution: Although considered circumpolar by some authors, the American range of *C. Bigelowii* strongly suggests that it belongs in the group of Amphi-Atlantic species. West of Bear Lake it is replaced by the closely related but apparently amply distinct *C. consimilis* Holm and *C. lugens* Holm. FIGS. 19,d; 16,$_{14}$. MAP 84.

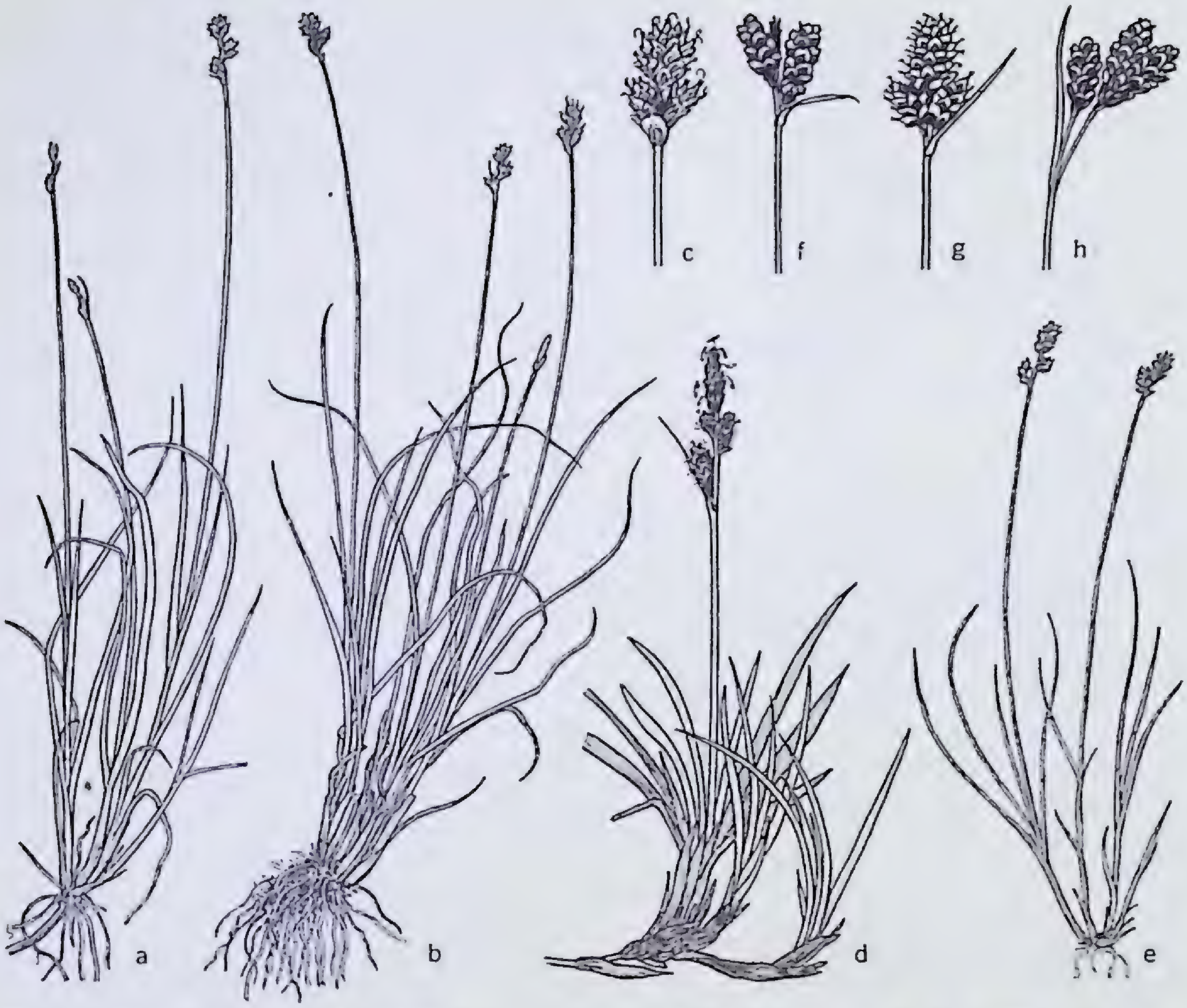

FIGURE 19. a. *Carex amblyorhyncha.* b. c. *C. Lachenalii.* d. *C. Bigelowii.* e. *C. glareosa* var. *amphigena.* f. *C. holostoma.* g. *C. norvegica.* h. *C. bicolor.* (1/2; c, f, g, h 1/1)

15. **C. lugens** Holm—Caespitose, forming large, rather firm tussocks. Culms 20 to 50 cm. high, sharply trigonous and scabrous on the edges, much longer than the rather narrow, flat, somewhat revolute leaves. Spikelets 3 to 4, the terminal staminate and linear, the lower pistillate, erect, short peduncled, short cylindrical or ovate, 8 to 12 mm. long. Pistillate scales linear, oblong, purplish black with a pale hyaline margin and a very narrow, green midvein, somewhat spreading at maturity, equalling the obovate, plump, purplish-mottled, 2 mm. long perigynia. Stigmas 3.

A western, subarctic-alpine species of mature tundra which, from Alaska over northern Yukon and N.W. Mackenzie, barely enters our area in Victoria Island.

General distribution: E. Asia to N.W. America. FIGS. 22,d; 16,$_{15}$. MAP 85.

16. **C. stans** Drej.—A coarse, stoloniferous sedge with stiff, smooth, or slightly scabrous obtuse-angled culms, 15 to 25 (40) cm. long, and almost as long, flat, or somewhat channelled, yellowish-green leaves. Seen under

a lens, the veins or ribs on the underside of the leaves are distinctly nodulose-septate. The sheath at the base of the culms is usually pale purplish, and the lowermost bract of the inflorescence green and leaf-like, as long as the inflorescence, or longer. Terminal 1 or 2 spikelets staminate, the lower 2 to 3 pistillate, somewhat remote, erect, short peduncled, cylindrical, 2 to 5 cm. long; pistillate scales purplish black and usually completely conceal the pale green or purplish blotched perigynia. Stigmas 2.

A variable species usually growing in bogs and marshy places where it may be confused with the tall form of *C. Bigelowii*, from which, however, it may be at once distinguished by its longer bract below the inflorescent and by its characteristically nodulose-septate leaf-veins. By some authors considered an arctic variety or race of the non-arctic *C. aquatilis*.

General distribution: N. American, arctic. FIGS. 20,a; 16,$_{16}$. MAP 86.

17. **C. subspathacea** Wormskj.—A turf-forming dwarf species with creeping rhizomes and very short, erect-ascending culms, which are frequently hidden among the short, flat, involute-margined, yellowish-green leaves. The bracts of the inflorescence leafy. Terminal spikelet staminate, the pistillate short-peduncled, somewhat remote, and few-flowered. Pistillate scales light brown with a pale midvein, longer than the nerveless perigynia. Stigmas 2.

A widespread arctic species, which is confined to the seacoast where it grows in wet clay on sheltered beaches flooded by high tide.

General distribution: Circumpolar, high-arctic. Fig. 20,b and 16,$_{17}$. MAP 87.

EUCAREX (*tristigmatae*)

18. **Carex norvegica** Retz.; *C. Vahlii* Schk.—Caespitose with stiff, sharply trigonous, scabrous culms which are much longer than the soft, flat, 1.5 to 2.5 mm. broad, scabrous leaves. Spikelets usually 3, in a dense, head-like inflorescence supported by a leaf-like bract, which equals or exceeds the inflorescence; the terminal spikelet club-shaped, staminate at the base, the lateral 5 to 7 mm. long, sub-sessile or short-peduncled. Pistillate scales ovoid, dark brown, monochrome, or with a very faint midvein, equalling the obovate, pale brown, papillose, and faintly nerved, abruptly beaked perigynia. Stigmas 3.

Turfy places in dry tundra and on grassy slopes, always on Precambrian acid rocks.

General distribution: Amphi-Atlantic, low-arctic. FIGS. 19,g; 16,$_{18}$. MAP 88.

19. **C. holostoma** Drej.—Stoloniferous; culms rather stout, smooth, 15 to 20 (30) cm. high, longer than the flat, light green leaves; the basal sheaths dark purplish. Spikelets 3, the terminal staminate and minute, often concealed between the cylindrical and mostly opposite or paired, less commonly, somewhat remote, stiffly erect, short-peduncled, 8 to 15 mm. long pistillate spikelets. Bract leafy, shorter or equalling the inflorescence. Pistillate scales ovate, blackish-brown, with a faint midvein, equalling the ovate-obovate, smooth, nearly beakless, pale green or brownish blotched perigynia. Stigmas 3.

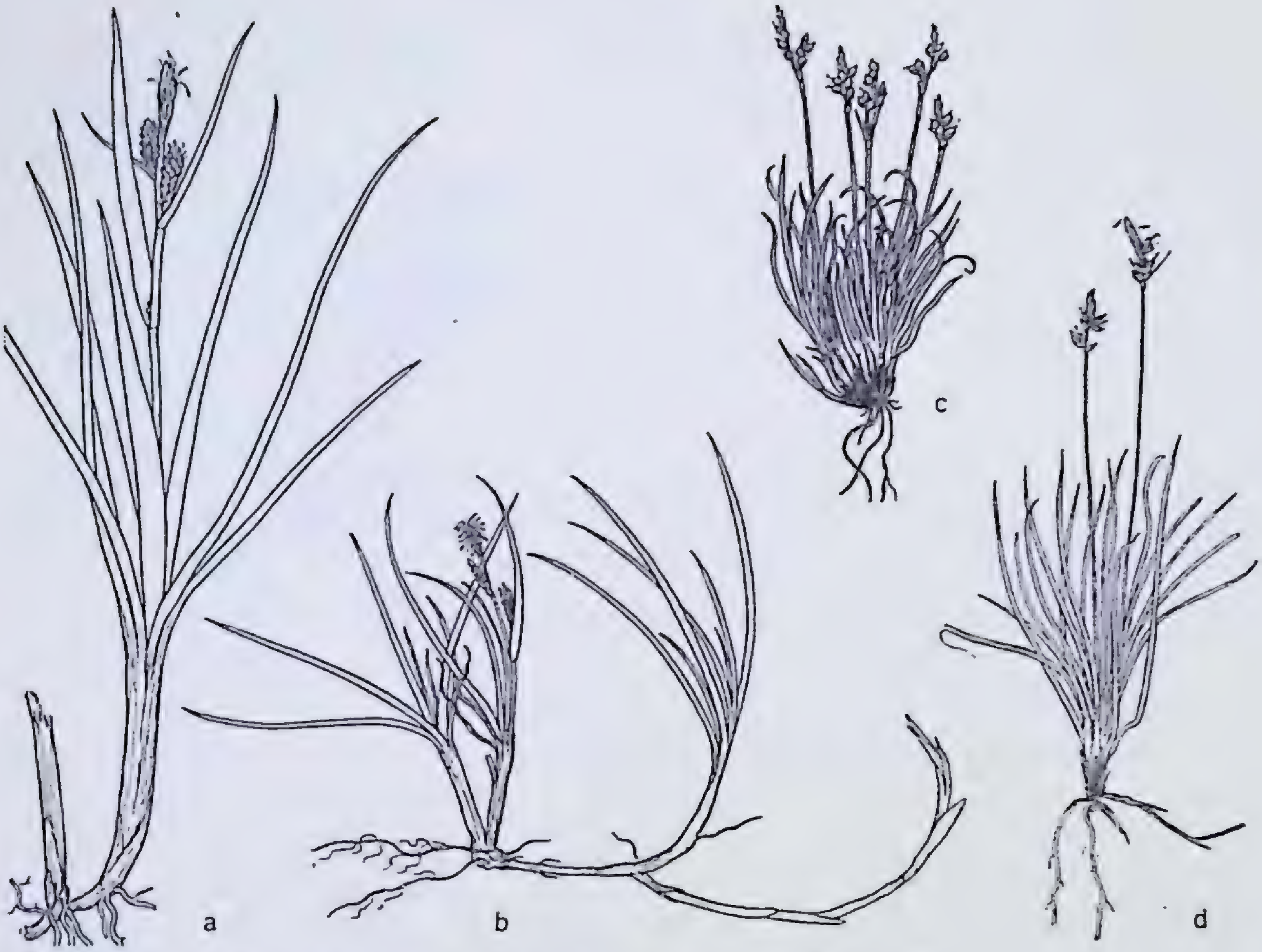

FIGURE 20. a. *Carex stans.* b. *C. subspathacea.* c. *C. glacialis.* d. *C. supina* ssp. *spaniocarpa.* (1/2)

In turfy places in tundra and by the edge of small ponds. A pronounced acidophyte.

General distribution: Long known only from central W. Greenland, *C. holostoma* is now recognized from a series of often widely separated stations from Bering Strait to central W. Greenland. Absent in E. Greenland but known from northern Iceland and from isolated stations in northernmost Scandinavia and E. Asia. FIGS. 19,f; 16,19. MAP 89.

20. **C. supina** Wahlenb. ssp. **spaniocarpa** (Steud.) Hult.—Stoloniferous with slender, brown stolons, from which rise tufts of leaves and culms. Culms 8 to 15 cm. long, erect, sharply trigonous and scabrous, longer than the narrow, crowded leaves. Spikelets 3, the terminal staminate and linear, the lateral pistillate, few-flowered, subglobose, sessile; the lowermost supported by short scale-like bract. Pistillate scales broadly ovate, chestnut brown with broad translucent and pale margins, slightly shorter than the ovate-globose, brown, shiny, prominently beaked perigynia. Stigmas 3.

In non-calcareous, dry, rocky and sandy places. In our area known only from Baffin Island.

General distribution: N. American, low-arctic. FIGS. 20,d; 16,20. MAP 90.

21. C. **glacialis** Mack.—Densely caespitose. Culms smooth, 8 to 15 cm. long, slightly longer than the narrow, flat, strongly keeled, somewhat curved leaves. Terminal spikelet staminate, the lateral 2 to 3 pistillate, erect, short-peduncled, and few-flowered; the lowermost supported by a sheathing bract terminating in a bristle-like blade. Pistillate scale obtuse, broadly ovate, with a pale midvein and broad translucent margins, shorter than the smooth, ovoid, brown, distinctly beaked perigynia. Stigmas 3.

Calcareous sandy and gravelly places.

General distribution: Circumpolar, arctic-alpine. FIGS. 20,c; $16,_{21}$. MAP 91.

22. C. **rariflora** (Wahlenb.) Sm.—Stoloniferous dwarf sedge with erect, smooth culms, 8 to 20 cm. high, and short, flat, glaucous leaves. Terminal spikelet staminate, erect, the lower 1 to 3 pistillate, short-cylindrical, at length drooping, on capillary peduncles. Bract sheathing, terminating in a short, subulate blade. Pistillate scales broadly ovate, often somewhat mucronate, purplish-black with a conspicuous pale midvein, broader than the pale green, faintly nerved, nearly beakless perigynia. Stigmas 3.

Wet, peaty places in tundra or in wet moss by the edge of brooks and ponds.

General distribution: Circumpolar, widespread low-arctic. FIGS. 21,f,g; $16,_{22}$. MAP 92.

23. C. **vaginata** Tausch; *C. sparsiflora* (Wahlenb.) Steud.—Stoloniferous with stiff, smooth culms, 15 to 20 cm. high, and short, flat, broad leaves. Terminal spikelet, staminate linear, on a stout, often somewhat divergent peduncle. Pistillate spikelets, 1 to 2, lax-flowered, cylindrical, 1 to 2 cm. long, usually somewhat distant, on erect, rather stout peduncles, each subtended by a sheathing, leafy bract. Pistillate scales lanceolate-ovate, light brown with a broad, green midvein, shorter than the yellowish-green, ovoid, nerveless, smooth, somewhat obliquely beaked perigynia. Stigmas 3.

Moist, calcareous rocky and turfy places.

General distribution: Circumpolar, low-arctic. FIGS. 21,b; $16,_{23}$. MAP 93.

24. C. **atrofusca** Schk.—Loosely caespitose, with erect, slender, smooth culms, 15 to 30 cm. high, and flat, revolute-margined, glaucous leaves. Spikelets 3 to 4; the terminal staminate, erect, club-shaped; the pistillate ovoid, 1 to 2 cm. long, drooping, on capillary peduncles subtended by sheathing, bristle-pointed bracts. Pistillate scales narrowly lanceolate, purplish black; as long as the purplish black, ovate-lanceolate, nerveless, beaked perigynia. Stigmas 3.

Wet places in tundra.

General distribution: Circumpolar, high-arctic. FIGS. 21,d; $16,_{24}$. MAP 94.

25. C. **misandra** R. Br.—Densely caespitose. Culms slender, smooth, somewhat flexuous, 15 to 25 cm. high, much longer than the short, flat, yellowish-green, somewhat curled leaves. Spikelets 3 to 4; the terminal club-shaped, staminate at the base, the rest pistillate throughout, ovoid,

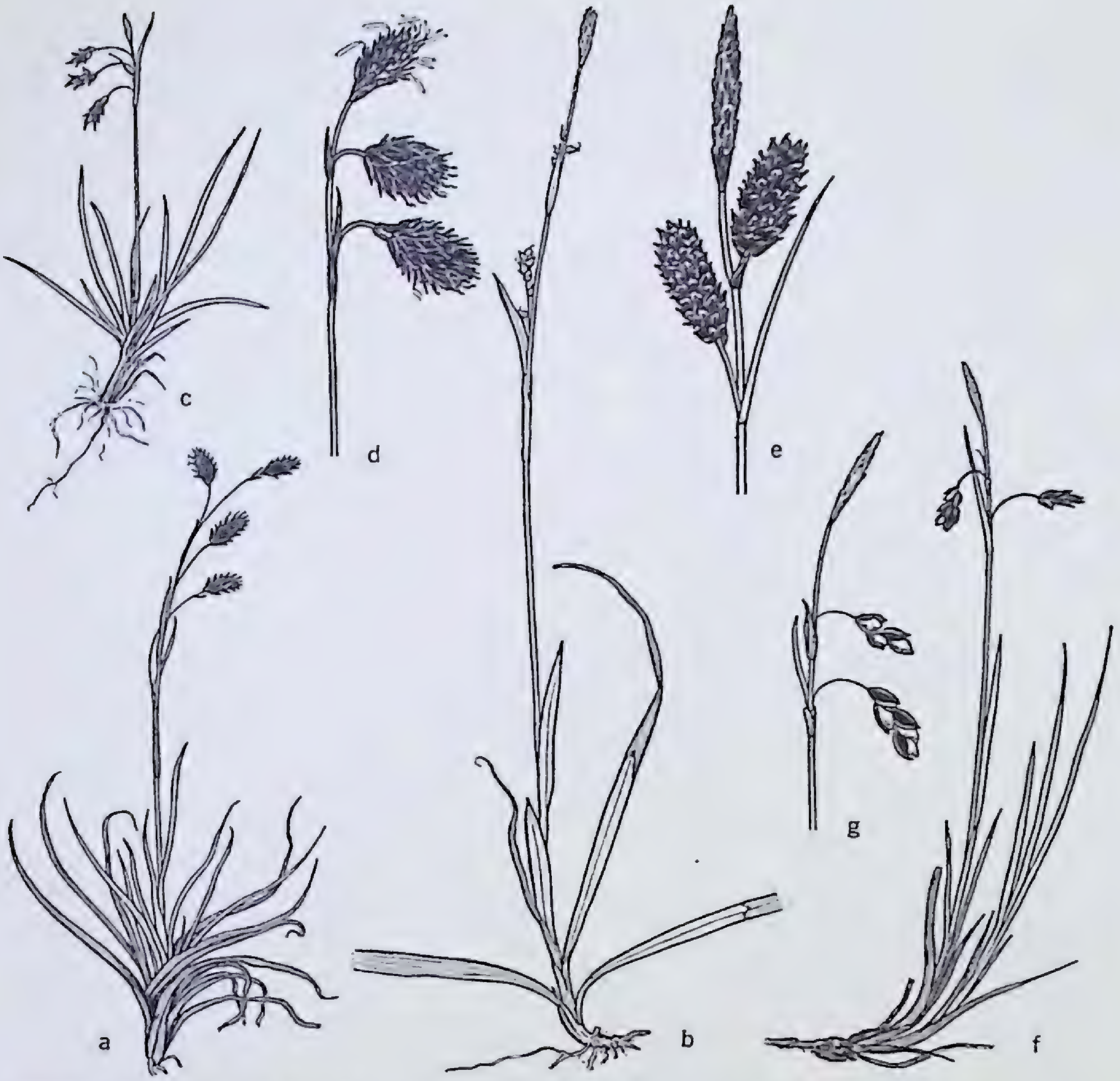

FIGURE 21. a. *Carex misandra.* b. *C. vaginata.* c. *C. capillaris* s. str.
d. C. *atrofusca.* e. *C. saxatilis.* f, g. *C. rariflora.* (1/2; d, e, g. 1/1)

10 to 15 mm. long, erect or somewhat nodding, on long, capillary peduncles, the lowermost subtended by a long-sheathing bract terminating in a bristle-like blade. Pistillate scales oblanceolate, dark brown with pale, membranaceous margins, slightly shorter than the lanceolate, dark-brown, scabrous margined, beaked perigynia. Stigmas 3.

Dry turfy places in tundra and rocky places.

General distribution: Circumpolar, wide-ranging, high-arctic. FIGS. 21,a; 16,$_{25}$. MAP 95.

26. **C. petricosa** Dew.—Stoloniferous with long scaly rhizomes. Culms slender, 15 to 35 cm. high, obtusely angled, smooth, slightly longer than the 2 to 3 mm. broad, revolute-margined, greyish-green, somewhat curly leaves. Spikelets 3 to 5, oblong-oblanceolate, 10 to 15 mm. long, the uppermost 1 to 2 staminate or sometimes pistillate at the base, the lower entirely

pistillate, or with a few staminate flowers at their summit, erect-ascending, long-peduncled, the lowermost usually remote. Bracts long-sheathing, their blade long and leaf-like. Pistillate scales oblong-ovate, obtuse or acute, dark brown with pale membranaceous margins and pale midvein, slightly shorter than the ovate-elliptic, 4 to 5 mm. long, dark brown, scabrous-beaked perigynia. Stigmas 3, or rarely 2.

Stony, calcareous slopes.

General distribution: Endemic of northern Cordillera. FIGS. 22,a; 16,$_{26}$. Map 96.

27. **C. capillaris** L.—Densely caespitose with filiform culms from 2 to 15 cm. high, and flat, yellowish-green leaves 1 to 3 mm. wide. The terminal spikelet staminate, small, and inconspicuous, or in var. *major* Drej. larger, and staminate only near the base. Pistillate spikelet 2 to 4, narrowly cylindrical, lax-flowered, erect or at length drooping, on capillary peduncles, the lowermost, frequently remote and concealed among the leaves. Bracts long-sheathing, with a leaf-like green blade. Scales broadly ovate, acute or obtuse, slightly shorter than the lanceolate-ovate, long-beaked, brown, lustrous perigynia. Stigmas 3.

A very variable species which in North America is composed of several more or less distinct races, of which *C. capillaris* s.str. and the var. *major* Drej. are chiefly of arctic range; the taller, loosely tufted, fresh green-leaved woodland race, var. *elongata* Olney, and the low N. Cordilleran var. *Krausei* (Boeck.) Kurtz, do not enter our area.

Calcareous clay and sand in wet tundra and by alpine brooks.

General distribution: *C. capillaris* s.lat.: Circumpolar, low-arctic. FIGS. 21,c; 16,$_{27}$. MAP 97.

C. Williamsii Britt.—Similar to No. 27, from which it differs by its tightly canaliculate or even convolute, bristle-like leaves, and few-flowered, and usually approximate and erect-ascending spikelets.

Calcareous sandy soil, often on hummocks by the edge of small ponds. Alaska to Labrador.

28. **C. physocarpa** Presl.—A coarse sedge with a stout, creeping rootstock. Culms 30 to 50 cm. high, smooth or slightly scabrous above, not much longer than the 3 to 4 mm. broad, revolute-margined, somewhat keeled, pale green leaves. Spikelets 3 to 4, the uppermost 2 (or 1) staminate and linear, the lower pistillate, cylindrical, 20 to 30 mm. long and 8 to 10 mm. wide, the upper subsessile and erect, the lowermost drooping, on a long capillary peduncle and subtended by a short-sheathing foliaceous bract as long as the inflorescence. Pistillate scales ovate, obtuse narrower and shorter than the ovate, distinctly beaked, dark brown and lustrous perigynia. Stigmas 2, rarely 3.

In shallow water along the sheltered margins of ponds or in springy calcareous places in wet tundra.

General distribution: E. Asia and subarctic-alpine N.W. America. FIGS. 22,c; 16,$_{28}$. MAP 98.

29. **C. saxatilis** L. —Similar to the preceding but with shorter and denser rootstocks, narrower and involute leaves, one terminal staminate spikelet, 1 to 2 short peduncled, erect, rarely drooping pistillate spikelets, usually with dull, blackish-brown perigynia. Stigmas 2, rarely 3.

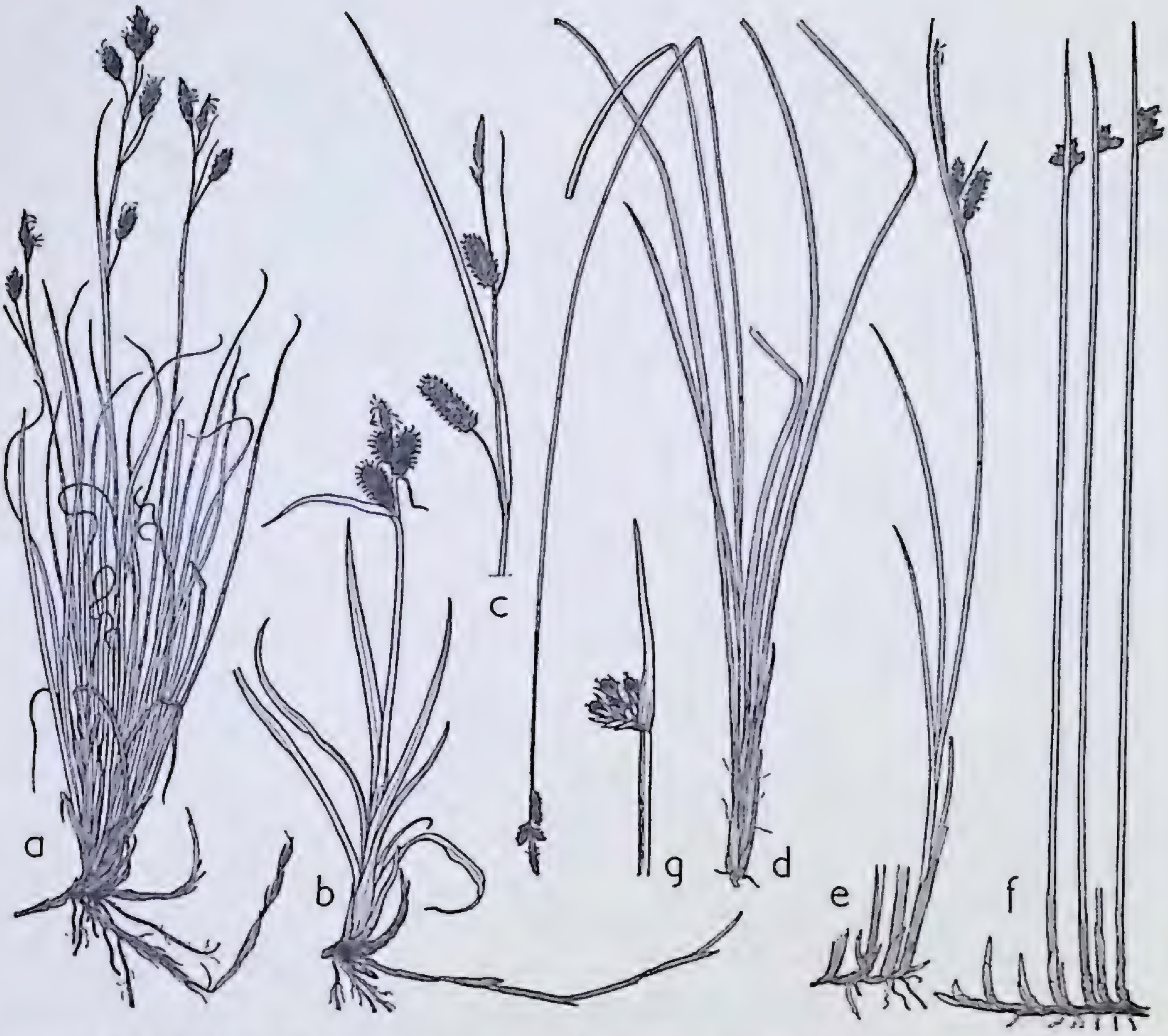

Figure 22. a. *Carex petricosa*. b. *C. membranacea*. c. *C. physocarpa*. d. *C. lugens*. e. *C. saxatilis* var. *miliaris*. f, g. *Juncus arcticus*. (1/3; g. 2/3)

In shallow water of acid tundra ponds and by the edge of small lakes. A variable species which is represented by the vars. *rhomalea* Fern. and *miliaris* (Michx.) Bailey, of which the former is arctic, the latter, subarctic and barely enters our area in southern Baffin Island. In var. *rhomalea* the stout rhizomes and leaf-bases are brownish-purple and the leaves broad and thick. The pistillate spikes are 1 to 3 cm. long and 5 to 8 mm. in diameter with 3 to 5 mm. long perigynia. The var. *miliaris* is a more slender plant with narrower leaves; its pistillate spikes are smaller and narrower, and the perigynia only 2.5 to 3.5 mm. long.

General distribution: *C. saxatilis*, circumpolar; the vars. *rhomalea* and *miliaris*: arctic and subarctic E. American. Figs. 21,e; 16,$_{29}$ (*C. saxatilis*). Figs. 22,e; 16,$_{31}$. Map 99 (var. *miliaris*). Map 100 (var. *rhomalea*).

30. **C. membranacea** Hook.—Caespitose and stoloniferous with scaly, stout stolons, of the habit of *C. Bigelowii*. Culms stout and stiff, 15 to 40 cm. high, obtusely triangular, smooth, the base covered with the persisting old leaves and their reddish-purple sheaths. Leaves flat, somewhat

curled, with revolute margins, 3 to 5 mm. wide, septate-nodulose under a lens, equalling or shorter than the culms. Spikelets 3 to 5, somewhat crowded, the terminal staminate, the lower all pistillate, sessile or short-peduncled, erect or somewhat spreading, dense-flowered, cylindrical, 1 to 3 cm. long, the lowermost subtended by long, leafy, non-sheathing bracts. Pistillate scales obtuse to acute, dark brown or purplish black, shorter than the inflated and tightly crowded, sub-orbicular, membranaceous, purplish-black, lustrous, abruptly beaked perigynia. Stigmas 3, rarely 2.

In turfy places in dry tundra.

General distribution: Arctic N. America reaching E. Asia but not Greenland. FIGS. 22,b; 16_{30}. MAP 101.

7. JUNCACEAE Rush Family

Herbaceous grass- or rush-like plants with small and inconspicuous but regular flowers consisting of 3 scale-like sepals and petals, 3 or 6 stamens, a single short style, and 3 hairy stigmas. The fruit is a 3-valved capsule.

Capsule many-seeded; plants totally glabrous	1. JUNCUS
Capsule 3-seeded; leaves and sheaths, at least in youth, mostly with a few soft white hairs	2. LUZULA

1. JUNCUS L. Bog Rush

Inflorescence apparently lateral, at the base of a terete bract which looks like the continuation of the culm; culm leafless, but with firm persistent sheaths at the base. Coarse plants with stout, subligneous horizontal rootstocks	
Panicle open, many-flowered; sepals as long as or slightly longer than the capsule, anthers longer than the thick, short filaments (Western species)	1. *J. balticus* var. *alaskanus*
Panicle dense, few-flowered; sepals shorter than the capsule, anthers shorter than the slender filaments (Eastern species)	2. *J. arcticus*
Inflorescence distinctly terminal although subtended by leafy or scaly bracts; culms leafy	
Culm leafy below	
Heads 1 to 3, capsule acute; coarse stoloniferous plant	3. *J. castaneus*
Head solitary, capsule obtuse; low, tufted plants	
Bract leaf-like, capsule retuse	4. *J. biglumis*
Bract scale-like, shorter or equalling inflorescence	5. *J. albescens*
Culm with 2–3 filiform leaves from below the inflorescence	6. *J. trifidus*

1. **J. balticus** L. var. **alaskanus** (Hult.) Porsild—The terete, stiff, wiry culms, 20 to 50 cm. high, appearing in more or less straight rows from a stout, scaly horizontal rootstock; the bladeless sheaths at the base of the culms reddish brown, firm, and somewhat lustrous. Inflorescence consists of several clusters of short-pedunculate flowers; capsule light brown, elliptic, with a short, conical point.

In wet calcareous sand or clay, on lake and river banks.

General distribution: Endemic of subarctic-alpine N.W. America. MAP 102.

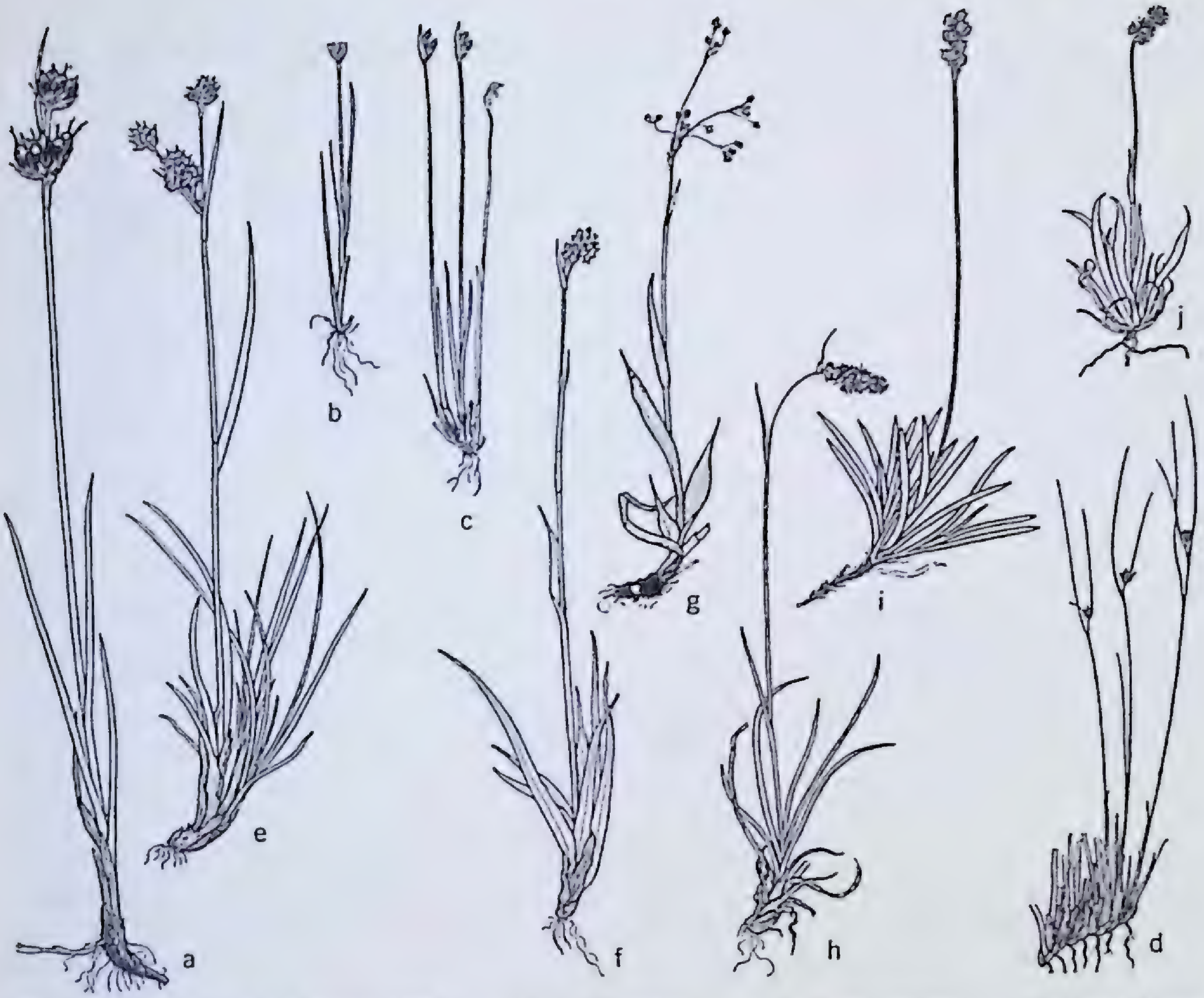

FIGURE 23. a. *Juncus castaneus.* b. *J. albescens.* c. *J. biglumis.* d. *J. trifidus.* e. *Luzula confusa.* f. *L. nivalis.* g. *L. Wahlenbergii.* h. *L. spicata.* i. *Tofieldia pusilla.* j. *T. coccinea.* (1/2)

2. **J. arcticus** Willd.—Similar; differs by its more capitate inflorescence of fewer and more or less sessile flowers, blackish-brown, obtuse or even retuse capsules, shorter sepals and shorter anthers on long, slender filaments.

In similar places as above.

General distribution: Amphi-Atlantic, subarctic-alpine. FIGS. 22,f,g; 24,c. MAP 103.

3. **J. castaneus** Sm.—Stoloniferous, with long, slender underground stolons. Culms 10 to 30 (50) cm. high, with well-developed leaves at their base. Inflorescence consisting of 1 to 3 somewhat distant, deeply chestnut-brown heads, each composed of from 4 to 10 flowers. The lowermost bract flat, leafy, and green, much longer than the inflorescence.

In wet sand or clay on lake shores or by brooks.

General distribution: Circumpolar, wide-ranging, low-arctic–alpine. FIGS. 23,a; 24,a. MAP 104.

4. **J. biglumis** L.—Caespitose, forming small, rather compact tufts of slender, but stiffly erect culms 5 to 20 cm. high. Inflorescence terminal in a 1- to 3-flowered head, subtended by a dark brown, leafy bract 1 to 3 cm.

long. Sepals dark brown; capsules narrowly club-shaped, dark brown, and conspicuously retuse.

In wet clay or sand in wet tundra or in moss by brooks or by the edge of ponds.

General distribution: Circumpolar, wide-ranging, arctic. Figs. 23,c; 24,e. Map 105.

5. **J. albescens** (Lge.) Fern.—Similar, but inflorescence 3- to 5-flowered, subtended by a very short, scaly bract. Sepals pale reddish-brown or straw-coloured; capsules elliptic, obtuse, never retuse, pale yellowish-brown.

Calcareous clay or sand, in wet tundra or by the edge of ponds.

General distribution: N. American, arctic-alpine; closely related to *J. triglumis* L. of Eurasia. Figs. 23,b; 24,b. Map 106.

6. **J. trifidus** L.—Densely tufted from a matted creeping rhizome. Culms 10 to 20 cm. high, stiff and wiry, their base densely covered by persisting yellowish-brown and somewhat lustrous and fibrous sheaths; 3-leaved at the summit. Inflorescence capitate, 3- to 5-flowered; capsules dark brown.

In exposed dry, sandy, or gravelly places.

General distribution: Amphi-Atlantic, subarctic. Figs. 23,d; 24,d. Map 107.

2. LUZULA DC. Woodrush

Inflorescence open; flowers sollitary at the tips of the ultimate branches of the inflorescence	1. *L. Wahlenbergii*
Inflorescence dense; flowers crowded in spikes or glomerules	
Leaves short, broad, and flat, with blunt, callous tips	2. *L. nivalis*
Leaves narrow, involute or channelled, with subulate, involute tips	
Inflorescence spike-like, nodding	3. *L. spicata*
Inflorescence capitate, sometimes with lateral glomerules on short spreading branches	4. *L. confusa*

1. **L. Wahlenbergii** Rupr.—Loosely caespitose with short rootstocks. Culms slender, 15 to 35 cm. high, usually bearing 2 to 3 leaves. Basal leaves flat, 3 to 5 mm. broad, linear, short acuminate, and glabrous. Panicle subcymose, the branches few-flowered, erect, arching, or sometimes drooping. Sepals and capsules dark brown.

Usually growing in sphagnum bogs in tundra, or less commonly in moss by brooks or on lake shores.

General distribution: Circumpolar, low-arctic. Fig. 23,g. Map 108.

2. **L. nivalis** (Laest.) Beurl.—Densely caespitose. Culms stiffly erect, 10 to 20 cm. high, often dark brown, leafy. Basal leaves flat, 3 to 5 mm. wide, with a few long, white hairs along the margins; the old leaves persisting for many years. Inflorescence subtended by a leafy bract, subcapitate, occasionally with 1 or 2 lateral, stalked glomerules. Bractlets with white, membranaceous, lacerated margins. Sepals ovate or lanceolate, dark brown, shorter than the ovate and mucronate capsules.

Common in heath and not too dry tundra; frequently on snowbeds associated with *Cassiope tetragona*.

General distribution: Circumpolar, high-arctic. Fig. 23,f. Map 109.

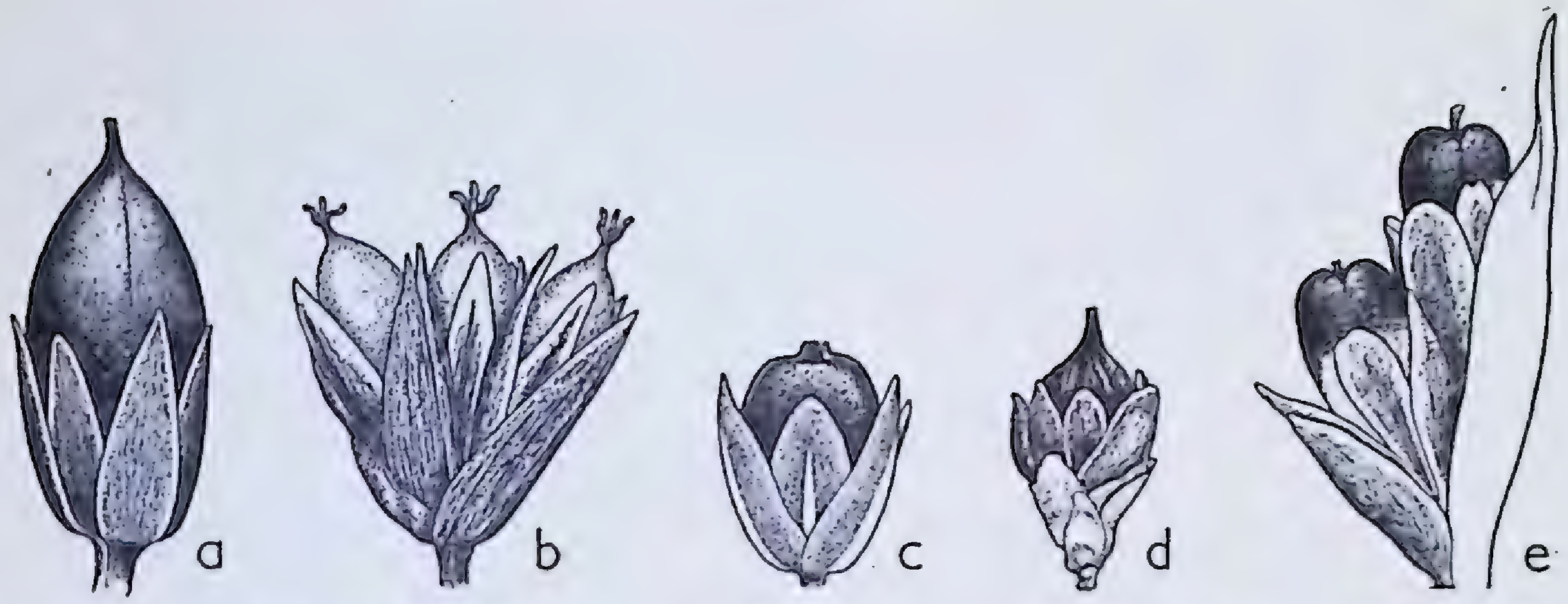

FIGURE 24. a. *Juncus castaneus.* b. *J. albescens.* c. *J. arcticus.* d. *J. trifidus.* e. *J. biglumis.* (3/1)

3. **L. spicata** (L.) DC.—Densely caespitose, with slender, leafy culms 20 to 35 cm. high. Leaves narrow and channelled, generally with a few soft white hairs along the margins. The interrupted, spike-like inflorescence nodding and subtended by a narrow, leafy bract. Bractlets lanceolate, with narrow, white, membranaceous, ciliated margins. Sepals lanceolate, bristle-pointed, equalling or slightly longer than the broadly ovate, dark brown capsules.

Dry, sunny slopes or rocky ledges.

General distribution: Circumpolar, low-arctic, with several large gaps. FIG. 23,h. MAP 110.

4. **L. confusa** Lindebl.—Loosely caespitose, with short underground stolons. Culms 10 to 30 cm. high, stiffly erect and leafy. Leaves narrow, channelled or involute and somewhat curled, with a few soft white hairs along the margins; the basal sheaths densely packed, dark brown, and persisting for many years. Inflorescence capitate or with lateral glomerules on stalked, erect, or arching branches. The subtending bract short and scale-like. Bractlets with membranaceous hairy margins. Sepals narrowly lanceolate and acuminate, as long as the dark brown, ovate capsules.

Dry, turfy places in tundra or on rocky slopes and ledges.

General distribution: Circumpolar, arctic-alpine. FIG. 23,e. MAP 111.

L. multiflora (Retz.) Lej. ssp. **frigida** (Buch.) Krecz. var. **contracta** Sam.—Tufted; leaves flat with soft white hairs along the margins; culms dark brown, stout and stiff; inflorescence of several dark reddish-brown globular heads, one usually projecting above the rest.

Turfy places, often by the edge of ponds. Alaska to W. Greenland.

8. LILIACEAE Lily Family

Within our area this large family is represented only by the genus *Tofieldia,* of which two species occur in the Archipelago. These are glabrous perennial herbs with sword-like, short, flat, evergreen leaves, simple erect scapes and capitate or short racemose inflorescences of small, regular, symmetrical, 3-merous flowers.

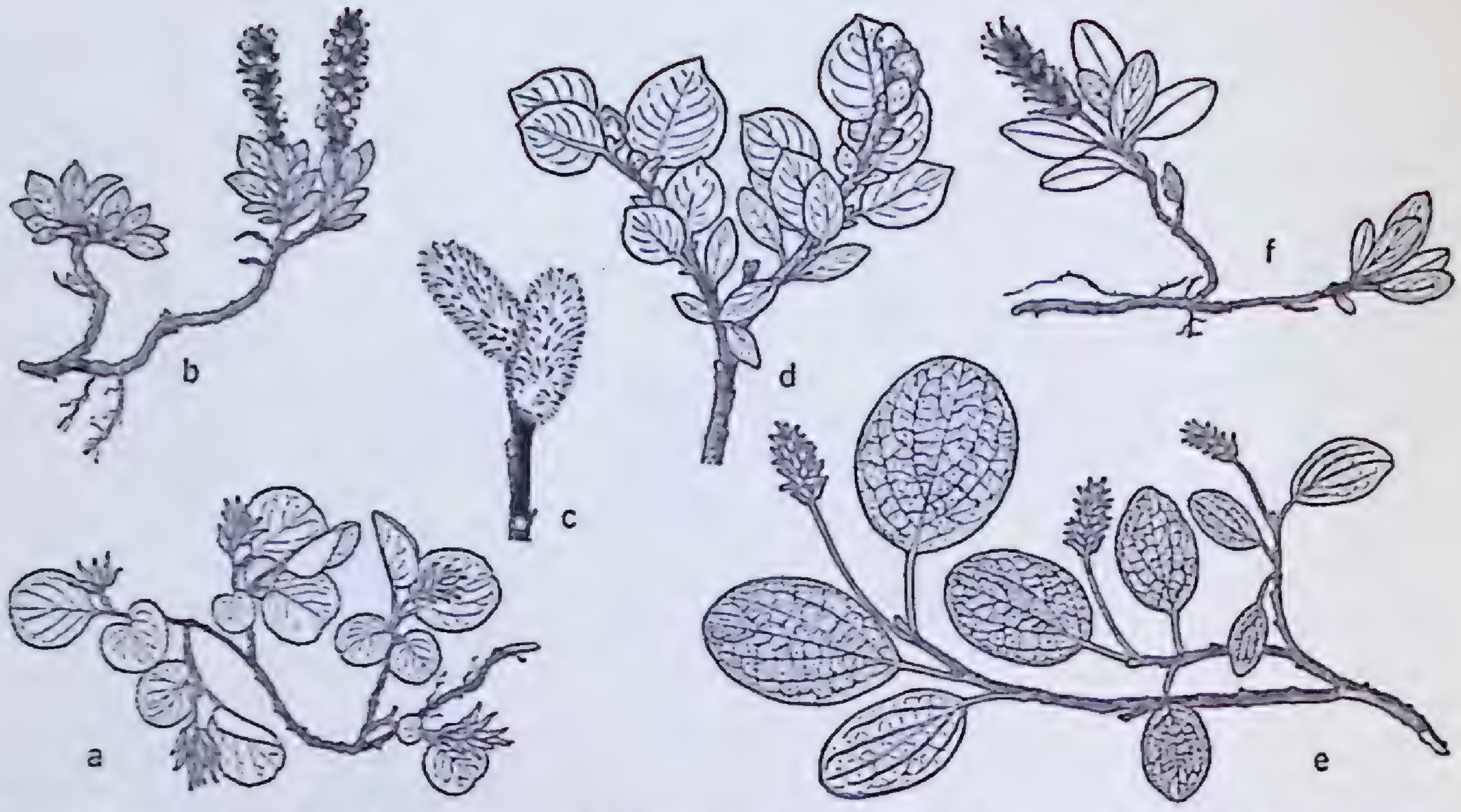

FIGURE 25. a. *Salix herbacea*. b. *S. Uva-Ursi*. c, d. *S. calcicola*. e. *S. reticulata*. f. *S. pseudopolaris*. (2/5)

TOFIELDIA Huds. False Asphodel

Scape pale green, naked, inflorescence yellowish-green 1. *T. pusilla*
Scape purple with one or more bracts; inflorescence dark purple 2. *T. coccinea*

1. **T. pusilla** (Michx.) Pers.—Densely tufted with a short, creeping rootstock. The 5 to 15 (20) cm. high scapes are slender and pale greenish-yellow, as are all parts of the capitate or short cylindrical inflorescence. The short-pedunculate capsules are erect.

Moist, turfy places in tundra and in wet moss by brooks.

General distribution: Circumpolar, low-arctic. FIG. 23,i. MAP 112.

2. **T. coccinea** Richards.—Of similar habit but with slightly shorter and stouter scapes that, like the inflorescence, are dark purplish-brown. The capsules, when mature, become reflexed.

A pronounced calciphile, rarely occurring outside the Palæozoic area where it grows in gravelly clay and in rocky places.

General distribution: N. America, E. Asia, wide-ranging, arctic. FIG. 23,j. MAP 113.

9. SALICACEAE Willow Family

In the flora of the Arctic Archipelago represented by the genus *Salix*.

SALIX L. Willow

Dioecious shrubs or dwarf trees with deciduous, alternate and entire leaves; flowers in erect or drooping, cylindrical male or female catkins, appearing with or before the leaves; the individual flowers subtended by a scaly brown, usually hairy bract, each with one or two nectar glands at its base. The fruit a capsule containing numerous small seeds, each bearing a tuft of long, silky down. Stigmas 2, often 2-lobed.

The larger species of willow provide a very important source of food for a number of arctic herbivorous animals. Thus, in winter, the twigs and young branches are eaten by caribou and muskoxen, and the bark and small twigs are eaten by Arctic hares and lemmings. Willow buds are one of the principal winter foods of ptarmigan, and in spring and early summer the young leaves and flowering catkins are eagerly eaten by herbivorous mammals and birds. The young leaves and buds of several species of willow are collected regularly by Eskimos and Chukchi for food and have been found to be exceptionally rich in vitamin C. Arctic willows, especially the dry, wind-killed stems of *S. arctica*, provide a ready fuel for outdoor cooking in some parts of the Arctic.

a. Ovaries and pedicels glabrous, even when young
b. Low, prostrate, or creeping shrubs, lacking persistent stipules
c. Mature leaves crenulate or serrate, 1.5 cm. long or less
d. Leaves orbicular, retuse; catkins few-flowered — 1. *S. herbacea*
d. Leaves lanceolate; catkins many-flowered — 2. *S. Uva-Ursi*
c. Mature leaves entire-margined, more than 1.5 cm. long — 10. *S. arctophila* f. *lejocarpa*
b. Erect-ascending, non-creeping, gnarly shrubs with persistent stipules and entire-margined leaves
e. Leaves broadly ovate to sub-orbicular; stipules half-cordate or reniform — 3. *S. calcicola*
e. Leaves obovate-elliptic or oblanceolate; stipules linear to half-cordate; acuminate — 4. *S. Richardsonii*

a. Ovaries and pedicels pilose, even when mature
f. Catkins on naked peduncles; leaves orbicular or broadly elliptic, leathery and strongly reticulate beneath — 5. *S. reticulata*
f. Catkins on leafy peduncles
g. Mature leaves small, 1.5 cm. long or less; dwarf, creeping species — 6. *S. pseudopolaris*
g. Mature leaves more than 1.5 cm long
h. Mature leaves permanently pubescent beneath
i. Young branches permanently velvety white-tomentose
j. Erect shrub or dwarf tree with thick twigs and branches — 7. *S. alaxensis*
j. Low, erect-ascending shrub with slender branches — 8. *S. niphoclada*
i. Young branches soon becoming glabrous — 9. *S. cordifolia*
h. Mature leaves glabrous or glabrate beneath
k. Pistillate scales light brown, lanceolate-acute or oblong-obtuse
l. Trailing shrubs — 10. *S. arctophila*
l. Erect-ascending shrubs — 11. *S. planifolia*
k. Pistillate scales of two colours, short, rounded, becoming black in age — 12. *S. arctica*

1. **S. herbacea** L.—A tiny, creeping shrub with thin, slender, freely rooting stems and branches, which are often completely buried in moss. Leaves orbicular, usually retuse, crenulate, glabrous, and dark green on both sides. Catkins small and few-flowered, appearing with the leaves and often hidden among them.

In herbmats, generally in places where the snow remains late. Common in the eastern Arctic and Subarctic, becoming progressively less common westward to Bear Lake.

General distribution: Amphi-Atlantic, low-arctic. FIG. 25,a. MAP 114.

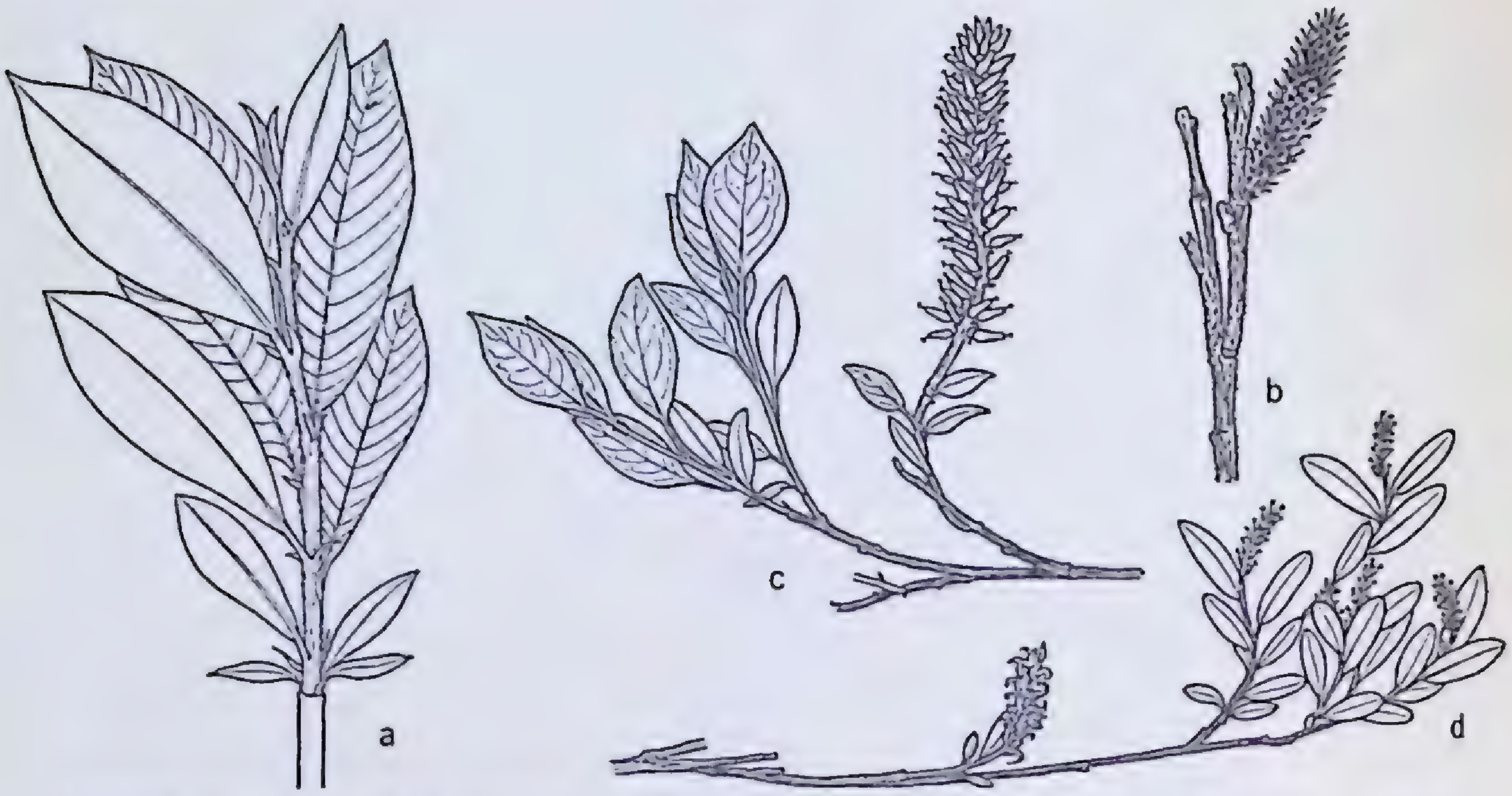

FIGURE 26. a,b. *Salix alaxensis.* c. *S. arctophila.* d. *S. niphoclada.* (2/5)

2. **S. Uva-Ursi** Pursh—Prostrate, mat-forming shrub with comparatively stout stems and leafy branches. Leaves lanceolate, dark green, and somewhat shiny above, paler beneath, with glandular-serrate margins. The old leaves persist for many years and in time become skeletonized. Catkins on leafy peduncles, appearing with the leaves; the pistillate ones 2 to 4 cm. long.

Exposed rocky and gravelly places.

General distribution: Endemic to S.W. Greenland and the eastern American Arctic. FIG. 25,b. MAP 115.

3. **S. calcicola** Fern.—Low, erect-ascending shrub with stout, gnarly stems and branches; those of the year lanate-pubescent. Leaves oblong-ovate to suborbicular or even subcordate, glabrous, entire-margined, green above, glaucous beneath, subtended by large, persistent, glandular-dentate stipules. Catkins large, the pistillate ones 3 to 7 cm. long, appearing before the leaves.

Calcareous rocky and gravelly places.

General distribution: Endemic of the eastern Canadian Subarctic with isolated stations in Newfoundland, the Gulf of St. Lawrence, and in the mountains of Banff National Park, Alberta. Lacking in Greenland. FIG. 25,c,d. MAP 116.

4. **S. Richardsonii** Hook.—Similar and probably closely related to the preceding, from which it differs by its normally narrower, oblanceolate leaves that are not glaucous beneath and by its narrower stipules. Catkins appear before the leaves. In the southern part of its range *S. Richardsonii* becomes taller and may attain a height of from 6 to 10 feet.

Well-watered sandy and gravelly places such as lake shores and riverbanks.

General distribution: A western N. America and E. Asiatic tundra species, common and widespread in Alaska-Yukon, ranging eastward across the Barren Grounds to the west shore of Hudson Bay and Baffin Island, where forms intermediate between *S. Richardsonii* and *S. calcicola* are frequent. The smaller leaved plant of the Eastern Arctic has been set aside as a geographic race: var. *McKeandii* Polunin, incorrectly said to have shorter and hairy-pedicelled capsules. Lacking in Greenland. FIG. 27,f. MAP 117.

5. S. **reticulata** L.—Prostate, with rather stout, freely rooting, few-leaved stems. Leaves orbicular-elliptic, leathery, glabrous, dark green and rugose above, glaucous and strongly reticulate beneath; in youth the underside of the leaves is silky pubescent. The rather small catkins, which appear with the leaves, are borne on subterminal, slender, naked, and usually villous peduncles.

Calcareous and not too dry, sandy, gravelly, or turfy places; near its northern limit usually found only in protected places where the snow remains late.

General distribution: Circumpolar, widespread arctic-alpine; lacking in Greenland. FIG. 25,e. MAP 118.

S. **vestita** Pursh—Dwarf shrub with stout, erect-ascending branches, and thick, leathery, ovate-elliptic leaves, dark green and reticulate above and white silky pubescent beneath. Ovary and capsule pubescent.

Calcareous, moist rock crevices and screes. Ungava south to Gaspé, west to Hudson Bay; var. *erecta* Anderss. also in mts. of Alberta and British Columbia.

6. S. **pseudopolaris** Flod.—A tiny creeping species with slender, thin, freely rooting, pale yellowish stems which, as a rule, are deeply buried in moss. The mature leaves are obovate-elliptic, usually 1 to 1.5 cm. (rarely 2 to 2.5 cm.) long, thin, fresh green on both sides, and somewhat lustrous above and prominently veined beneath. The catkins appear with the leaves; those of the female plant are large for the size of the plant, varying from 2 to 4 cm. in length. The obovate-orbicular, often retuse, white-villous bracts are reddish-purple, drying black.

In not too dry, mossy, and well-protected places where the snow remains late.

General distribution: E. Asia and N.W. America, arctic-alpine. FIG. 25,f. MAP 119.

7. S. **alaxensis** (Anderss.) Cov.—An erect shrub which may form low thickets in protected places in the western islands; farther south it becomes tree-like. Stems thick and gnarled; the young twigs and branches permanently and conspicuously white velvety-tomentose. Mature leaves oblanceolate-elliptic, permanently white velvety-tomentose beneath, dull green above, with rather short petioles, strongly dilated at the base, and persistent, linear stipules; the blade 4 to 8 cm. long and 2 to 3.5 cm. wide. The sessile catkins appear before the leaves and even in flower are large, the pistillate ones mostly over 4 cm. and frequently up to 12 cm. long. The young leaves are very fragrant.

Well-watered sandy and gravelly places, pre-eminently on gravel and sandbars of lakes and rivers.

General distribution: E. Asia and N.W. and Central N. American Arctic. FIG. 26,a,b. MAP 120.

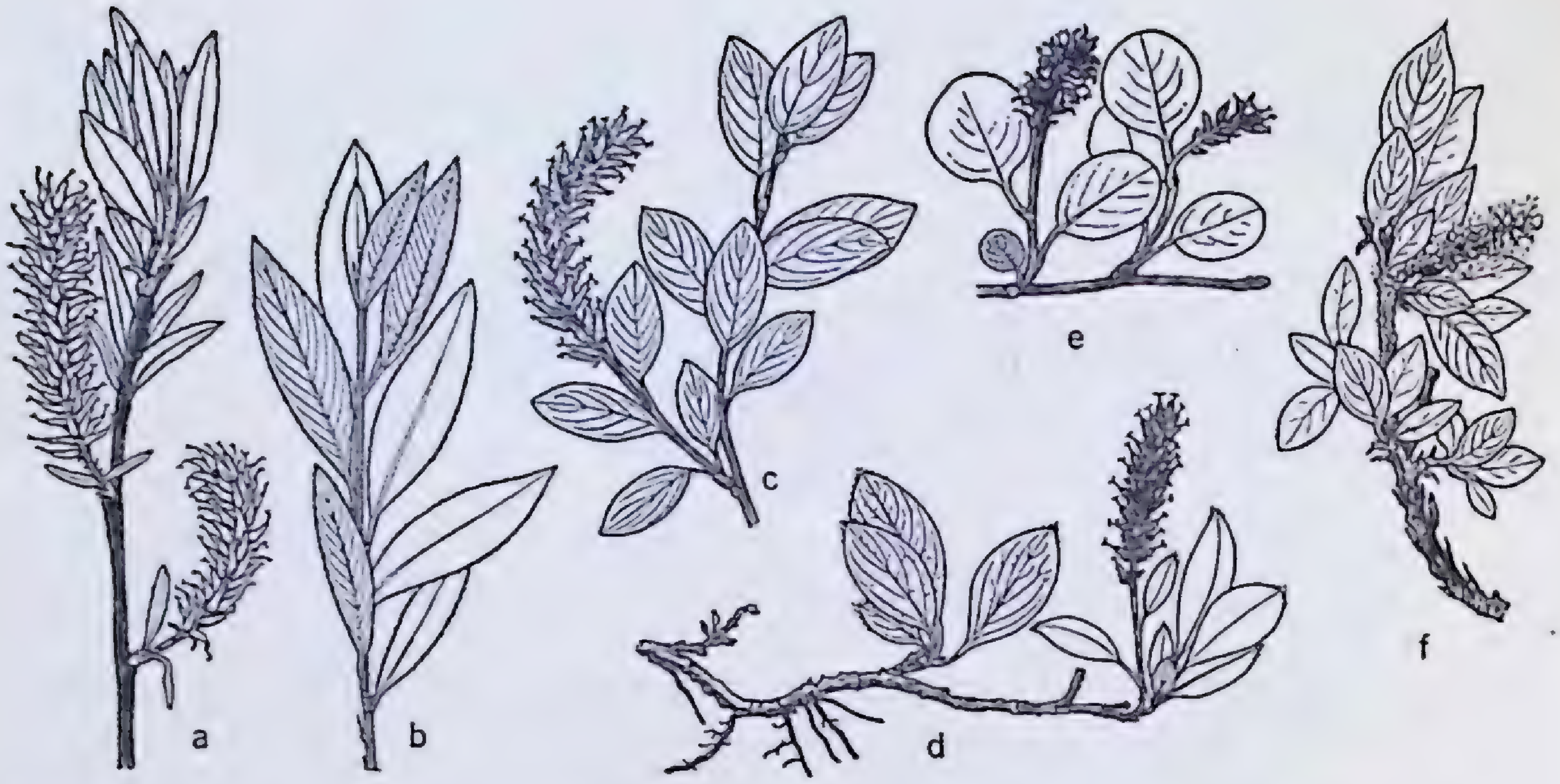

FIGURE 27. a, b. *Salix planifolia.* c. *S. cordifolia* var. *intonsa.* d. *S. arctica.* e. *S. arctica* var. *kophophylla.* f. *S. Richardsonii.* (2/5)

8. **S. niphoclada** Rydb.—A low shrub with erect-ascending, slender stems, in our area rarely rising more than 10 to 15 cm. above the ground but farther south occasionally forming a low scrub up to 50 cm. in height. The young twigs are grey from a thin, white, appressed tomentum, which barely conceals the darker colour of the bark underneath. The subsessile or very short petioled mature leaves are oblong-lanceolate to ovate-lanceolate, 1.5 to 3.5 cm. long; the upper surface is green with a sparse pubescence of appressed hairs, the lower grey with a more copious and permanent pubescence of appressed hairs. Catkins on leafy peduncles appear with the leaves; the pistillate ones slender, 2 to 3 cm. long, somewhat lax-flowered, their bracts pale brown, almost orbicular to obovate; the ovaries permanently white tomentose, with short styles.

Calcareous talus slopes in gravelly places and on cliffs.

General distribution: Endemic of western N. American Arctic. FIG. 26,d. MAP 121.

S. fullertonensis Schneid.—Prostrate shrub with slender rooting stems, and entire, lanceolate leaves, 1.5 to 2.0 cm. long, pale green and glabrate above, paler beneath. Catkins, 2 to 3 cm. long, on short, leafy peduncles. Capsules pubescent. Moist, stony lake shores and barrens. Endemic to northern Keewatin district.

9. **S. cordifolia** Pursh, s. lat.—An erect-ascending shrub, but in the Arctic usually prostate, although not creeping, with rather stout branches; twigs of the year usually pubescent. The mature leaves elliptic to ovate, obovate or even suborbicular, 1 to 9 cm. long and 0.5 to 5 cm. broad, permanently greyish pilose or villous on both sides and on the slender petioles. The catkins of the female plant large, 1 to 7 cm. long, appearing with the leaves, its bracts yellowish-brown; the ovary and capsule densely grey, hirsute; styles long.

A highly variable and critical eastern species, which in the Eastern Arctic is represented by the following varieties:

Leaves of fruiting branches oval to ovate and even obovate, cordate or rounded at the base, mostly 3 to 7 cm. long	*S. cordifolia* var. *typica*
Leaves of fruiting branches not cordate, if rounded at the base, mostly smaller or narrower, mostly 2.5 to 6 cm. long, oblanceolate, oblong, elliptic, or narrowly obovate	
Leaves glabrate in maturity or merely silky on the nerves beneath	*S. cordifolia* var. *callicarpaea* (Trautv.) Fern.
Leaves permanently and rather densely villous	*S. cordifolia* var. *intonsa* Fern.

Within our area perhaps restricted mainly to sheltered and favourable exposures having an abundant snow cover in winter. In such places the species may form low thickets, seldom more than 50 cm. high, or it may grow flat on the ground or rise espalier-like against a south-facing rock.

General distribution: Endemic of eastern N. American Arctic, becoming progressively scarcer westward, where it is eventually replaced by related species of the *Glaucae* group (*S. glauca* var. *acutifolia* (Hook.) Schneid. and *S. niphoclada* Rydb.). *S. glauca* L. var. *stenolepis* (Flod.) Polunin, reported from southern Baffin and Southampton islands, when better known may prove to be a form of *S. cordifolia* var. *callicarpaea*. FIG. 27,c (var. *intonsa*). MAP 122 (incl. vars. *intonsa* and *callicarpaea*).

10. **S. arctophila** Cockerell—Always prostrate with trailing, brownish-green barked branches that tend to turn black in drying. Leaves elliptic to obovate or oblanceolate, with subentire margins and acutish or rounded tips, 2 to 4, or rarely 6 cm. long and 1 to 2, rarely 2.5 cm. wide, totally glabrous, dark green and lustrous above, distinctly paler beneath. Catkins large, on leafy peduncles, usually stiffly erect, appearing with the leaves; the pistillate ones at maturity from 3 to 10 cm. long; the bracts brown, bearded at the apex; ovaries and capsules thinly pubescent becoming glabrescent, or totally glabrous in f. *lejocarpa* (Anderss.) Fern.

Common in rather wet, mossy tundra and by brooks or lake shores.

General distribution: Eastern N. American Arctic. FIG. 26,c. MAP 123.

11. **S. planifolia** Pursh—Much branched, low, erect or spreading shrub, which south of our area becomes 6 to 8 feet high, with glabrous, sometimes glaucous or pruinose branches. Leaves glabrous, elliptic-lanceolate to oblong, with entire or minutely and remotely dentate margins, dark green and lustrous above, glaucous beneath; petioles short, lacking stipules. Catkins sessile or with a few rudimentary stipules at their base, appearing before the leaves; those of the female plant 3 to 4.5 cm. long, with dark, silky-villous bracts. Capsules whitish silky.

Snowpatches and sheltered slopes.

General distribution: Endemic of subarctic N. America. FIG. 27,a,b. MAP 124.

S. pulchra Cham.—A western species, in habit resembling No. 11, from which it differs by its dull green leaves that, together with its prominent and persistent stipules, remain on the twigs until next year's catkins are mature.

By tundra streams and on sheltered lake- and river-banks. N. American, W. Arctic; Asia.

12. **S. arctica** Pall.—A decumbent, often matted and never erect shrub with trailing, glabrous branches and variously shaped entire-margined leaves. The blades of the mature leaves elliptic-obovate to broadly rounded-ovate, 2.5 to 7 cm. long and 1.5 to 2.5 cm. wide, glabrate or glabrous, dull green above, scarcely paler beneath, with a sparse but long-villous pubescence. Petioles about one third the length of the blade, not subtended by stipules. Catkins on leafy peduncles and appearing with the leaves, those of the female plant not stiffly erect as in *S. arctophila*, 3 to 7 cm. long, their bracts long-bearded, with dark brown or blackish tips and paler bases; ovaries and capsules permanently short-pubescent.

Like *S. cordifolia* a very variable and rather critical species represented in the Eastern Arctic by two consistently smaller-leaved but otherwise poorly delimited races, which by some students of willows are considered varieties of a distinct, eastern species: *S. anglorum* Cham. These are as follows:

Leaves broadly ovate, obovate or even elliptic-orbicular, rounded or subcordate at the base, glabrate in age	*S. arctica* var. *kophophylla* (Schneid.) Polunin
Leaves mostly ovate, elliptic or ovate-lanceolate, rounded or cuneate at the base; thinly silky pubescent below, even in age	*S. arctica* var. *Brownii* Anderss.

The latter seems merely a more arctic and small-leaved form of *S. arctica.*

The most arctic of the willows of our area and the only one ranging beyond the 80th parallel, and perhaps also the most adaptable as to habitat. Most frequently and best developed in rather moist and sheltered habitats but not infrequent growing in exposed, stony or gravelly places. In the Far North perhaps always restricted to snowpatch habitats.

General distribution: Circumpolar, arctic-alpine. FIG. 27,d (*S. arctica*), e (var. *kophophylla*). MAP 125 (*S. arctica* s. lat.)

10. BETULACEAE Birch Family

BETULA L. Birch

Deciduous shrubs or trees (in our area prostrate and trailing shrubs) with pistillate and staminate flowers in scaly aments; the former without a calyx or involucre, each producing a small, compressed and winged nut; the latter with 2 to 4 parted calyx and 2 or 4 stamens.

Young branches and twigs covered with large resinous, wart-like glands; tip of twigs not pubescent	1. *B. glandulosa*
Young branches and twigs lacking resinous wart-like glands; tip of young twigs pubescent	2. *B. nana*

1. **B. glandulosa** Michx.; GROUND or DWARF BIRCH—Depressed, matted or ascending shrub with obovate to orbicular, leathery, 0.5 to 3.0 cm. long, somewhat shiny leaves, uniformly dark green on both sides.

On rocky, south-facing slopes, chiefly on acidic rocks; in our area restricted to places having an abundant snow cover. Where abundant, the

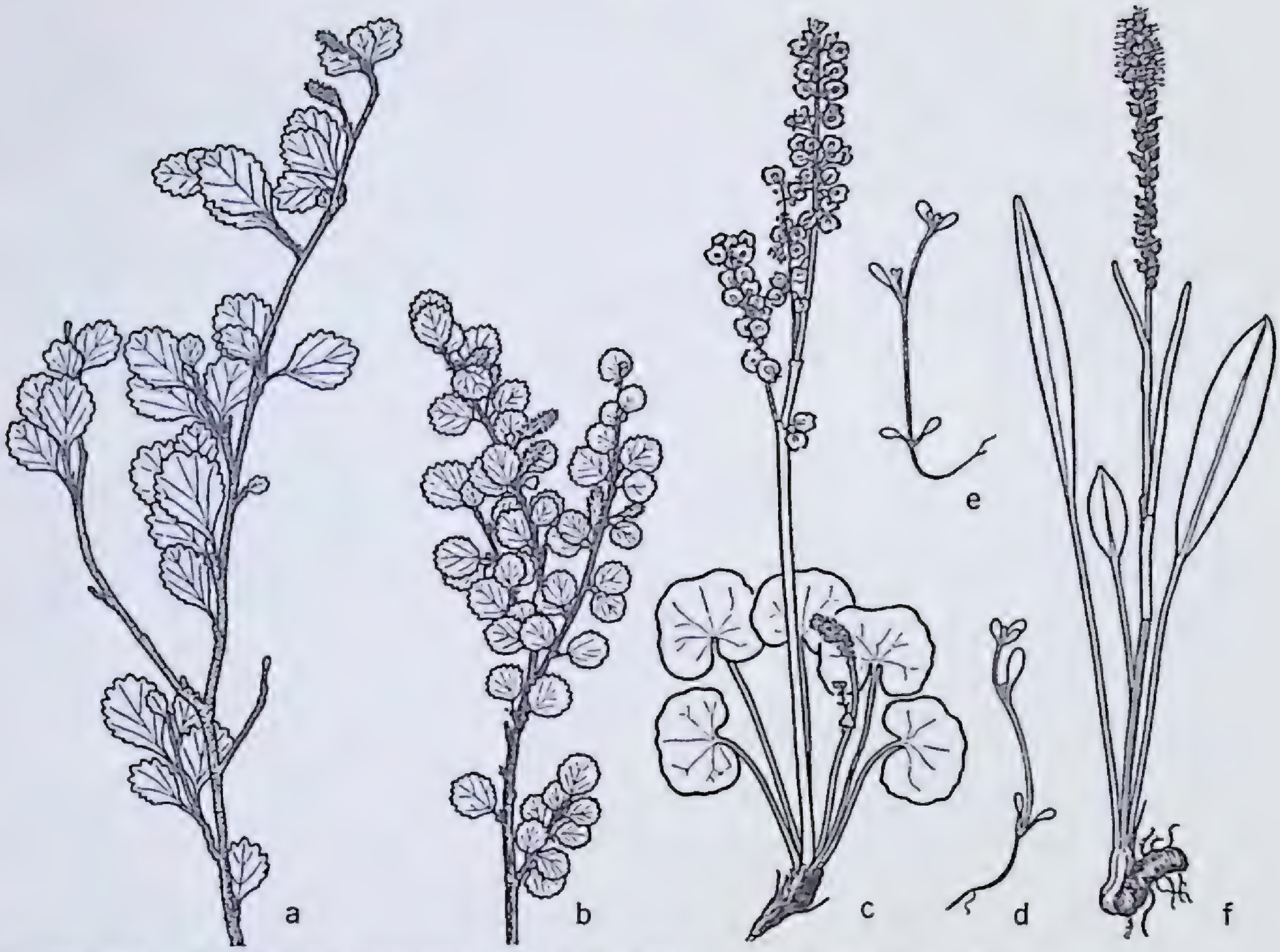

FIGURE 28. a. *Betula glandulosa.* b. *B. nana.* c. *Oxyria digyna.* d, e. *Koenigia islandica.* f. *Polygonum viviparum.* (2/5)

ground birch provides a valuable source of fuel for outdoor cooking. Owing to its scarcity and local occurrence, it is, however, of slight importance in our area.

General distribution: N. America, widespread, low-arctic. FIG. 28,a. MAP 126.

2. **B. nana** L.—Similar but at once distinguished by its pubescent young twigs which lack resinous glands.

In similar places but very rare and local.

General distribution: Amphi-Atlantic, low-arctic, common in central E. and W. Greenland between Lat. 63 and 75°N., but in N. America otherwise known only from a few stations near the head of Cumberland Sound in southern Baffin Island. FIG. 28,b. MAP 127.

11. POLYGONACEAE Buckwheat Family

Herbs with alternate simple leaves, and membranaceous, sheathing stipules above the swollen joints of the stem; flowers small, regular; petals lacking, sepals 3 to 6 parted, sometimes petaloid; 4 to 12 stamens; a 1-locular ovary and 1 to 3 styles; fruit an achene.

Annual	1. KOENIGIA
Perennial	
Leaves reniform; sepals 4; stigmas tufted	2. OXYRIA
Leaves oblong-lanceolate; sepals 5, stigmas capitate	3. POLYGONUM

1. Koenigia L.

Koenigia islandica L.—Dwarf annual, often only a few centimetres high with erect or ascending, filiform, simple or branched stems bearing a few obovate, often reddish-purple, sessile leaves, those near the summit usually arranged in a whorl around the tiny, 3-parted flowers.

Occasional to common in the Eastern Arctic, in wet moss in springy places, or in wet sand or silt by the edge of small lakes or tarns. One of the few annual members of the arctic flora.

General distribution: Circumpolar, low-arctic. Fig. 28,d,e. Map 128.

2. Oxyria Hill

Oxyria digyna (L.) Hill; Mountain Sorrel.—Perennial herb with a short rootstock bearing clusters of long-petioled, reniform, fresh green, somewhat succulent leaves. The scapose or few-leaved flowering stem 10 to 30 cm. high, terminating in open, panicled racemes of small reddish-green or crimson flowers on slender pedicels. The achene lenticular, thin and flat, much larger than the calyx; surrounded by a broad, transculent wing.

Common in cool, moist ravines where the snow remains late. The species responds readily to fertilizer as shown by its luxuriant growth on moist ledges below bird cliffs and near human habitations.

The succulent, mildly acid leaves and young stems of the mountain sorrel are edible and may be eaten raw as a salad, cooked as a green or pot-herb, or stewed as rhubarb. Owing to its high vitamin content, its wide distribution and local abundance, mountain sorrel is among the most important edible plants of the Arctic, where it is gathered regularly by the Eskimo who eat the leaves fresh or preserved with seal oil. The fresh leaves and stems of the mountain sorrel are eagerly sought by caribou, muskoxen, and geese, whereas arctic hares and lemmings prefer the fleshy rhizomes.

General distribution: Circumpolar, widely distributed arctic-alpine. Fig. 28,c. Map 129.

3. Polygonum L. Knotweed

P. viviparum L.; Bistort—Perennial herb with a short, often contorted or twisted, starchy rootstock terminating in a cluster of slender-petioled oblong-lanceolate, dark green, somewhat shiny leaves. Stems from a few to 30 cm. high, usually bearing one or two short-petioled or sessile leaves and terminating in a spike 2 to 10 cm. long in which the lower flowers are replaced by bulbils. The white or pale pink flowers of the upper half of the spike appear normal but as a rule are sterile and only rarely produce mature and viable achenes.

Common or even ubiquitous, occurring in turfy places, rocky barrens, as well as in moist grassy herbmats. Like the preceding, it strongly favours manured places and for this reason attains luxuriant growth near human habitations and below bird cliffs.

The pecan-sized, starchy and slightly astringent, edible rootstock of the bistort may be eaten raw but is most palatable when cooked. It is a choice delicacy of several Eskimo tribes, who preserve the rootstocks by freezing, or in seal oil. The bulbils are eaten by ptarmigan and lemmings.

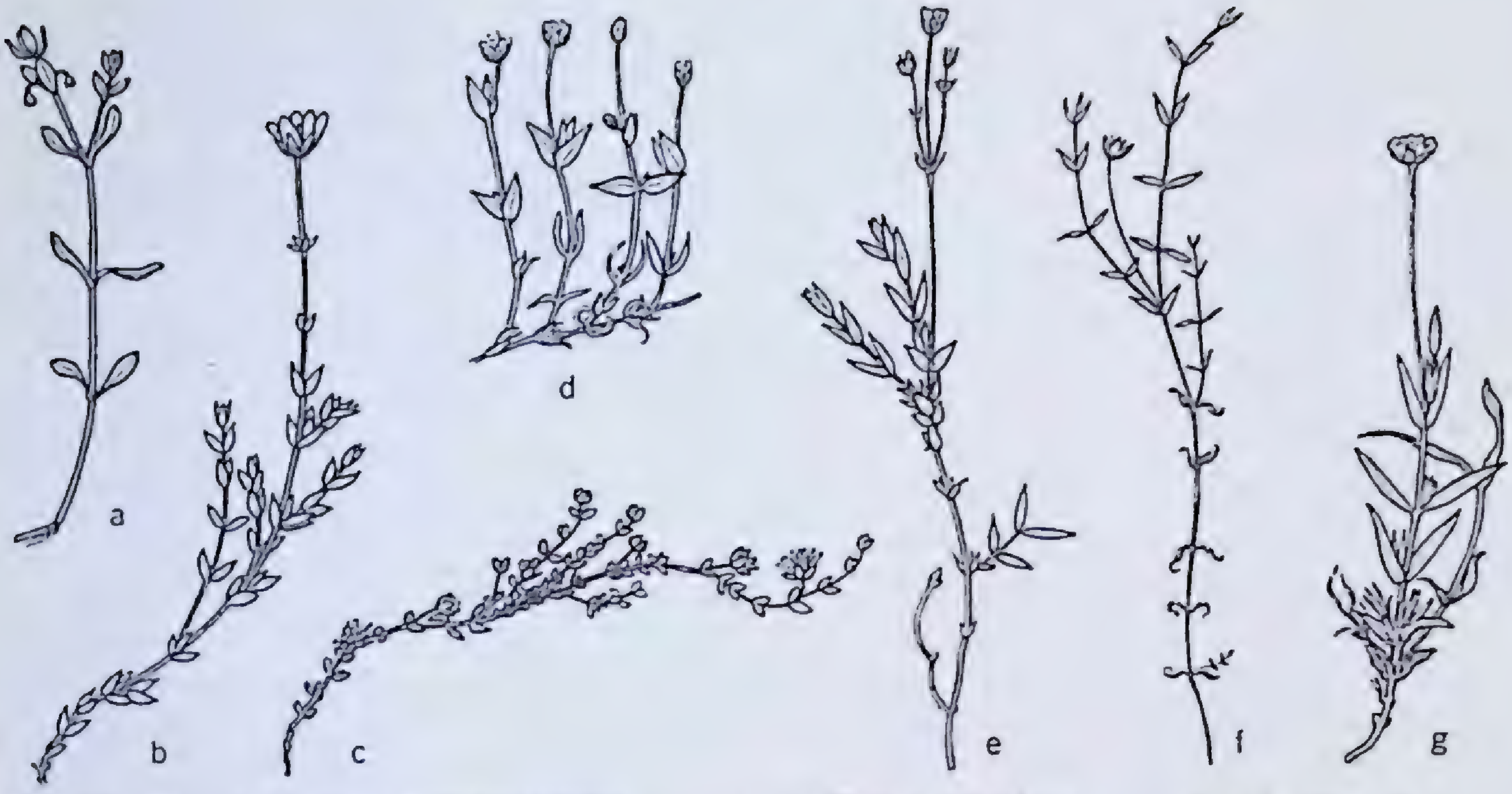

FIGURE 29. a. *Montia lamprosperma.* b. *Stellaria crassipes.* c. *S. humifusa.* d. *S. laeta.* e. *S. ciliatosepala.* f. *S. crassifolia.* g. *S. monantha.* (1/2)

General distribution: Circumpolar, widely distributed arctic-alpine. FIG. 28,f. MAP 130.

RUMEX L. Dock

Rumex arcticus Trautv.—Glabrous perennial with erect, simple stems from a stout fleshy rootstock; leaves mostly basal, the blades dark green and somewhat fleshy, oblong-oval to narrowly lanceolate, 7 to 30 cm. long and 2 to 5 cm. wide. Flowering stems 25 to 100 cm. high, terminating in a simple or short-branched panicle of small, reddish flowers.

Moist, turfy places by lakes and ponds or among willows. Western N. Am. Arctic; Eurasia.

12. PORTULACACEAE Purslane Family

Represented in the Arctic Archipelago by the following:

MONTIA L.

M. lamprosperma Cham.; BLINKS—Small, pale-green or yellowish, somewhat succulent annual with simple or forked, weak stems, and opposite, narrow, and ligulate leaves. Flowers small, solitary or in pairs, from the leaf-axils or from the tips of the stems. Sepals 2; petals and stamens 3 to 5. Capsule 1-locular, containing a few black and highly lustrous seeds. Usually growing in wet, springy places among mosses along brooks or among tall sedges or grasses by the edge of stagnant and muddy ponds, less commonly in open places in wet sand or mud when the stems become prostrate and somewhat tufted.

The spotty and uneven distribution in the Central North American Arctic of *Montia lamprosperma*, like that of *Koenigia islandica*, is peculiar. Both are admittedly small and elusive species that are easily overlooked by the collector, but the large gaps in their distribution is undoubtedly due largely to the vicissitudes of an extreme continental climate which must be most hazardous to plants with annual life cycles.

General distribution: Circumpolar, low-arctic. FIG. 29,a. MAP 131.

13. CARYOPHYLLACEAE Pink Family

Herbs with opposite, entire leaves, and stems that are usually somewhat swollen at the nodes; flowers symmetrical, 4- to 5-merous, with or without petals; stamens usually twice the number of sepals; styles 2 to 5; fruit (in ours) a several to many-seeded capsule.

Sepals distinct or nearly so; petals without claws, or none	
Petals cleft, or none	
Styles usually 3; capsule ovoid or ellipsoid	1. Stellaria
Styles usually 5; capsule cylindrical	2. Cerastium
Petals entire or notched, or none	
Styles as many as the sepals and alternate with them	3. Sagina
Styles fewer than the sepals and opposite them	4. Arenaria
Sepals united into a more or less inflated, many-nerved tube	
Styles 3	5. Silene
Styles 5	6. Melandrium

1. Stellaria L. Chickweed

Essentially glabrous perennial herbs with ascending, prostrate or creeping and freely rooting stems bearing rather small, in ours sessile, opposite leaves. The rather small, white flowers solitary or cymose, terminal or appearing lateral by the prolongation of the stems from the upper leaf axils. Petals 5, very deeply cleft; styles 3; capsule 1-locular, opening by 6 valves.

In the Arctic all species, in addition to normal sexual reproduction, reproduce vegetatively by axillary leaf buds.

Leaves more or less lustrous, firm, not fleshy, green or glaucous and keeled. Capsules (when present) dark brown or black, shining	1. *S. longipes* s. lat.
Leaves dull green, not glaucous, flat and somewhat fleshy; capsules straw coloured	
Sepals equalling the mature capsule; seeds smooth. Matted plants of the seashore	2. *S. humifusa*
Sepals shorter than the mature capsule; seeds wrinkled. Delicate plant of wet meadows, usually growing among tall grasses and sedges	3. *S. crassifolia*

1. **S. longipes** Goldie s. lat.—Erect or decumbent, matted or in exposed places even densely caespitose perennial. Leaves stiff, linear-lanceolate and usually glaucous. Flowers terminal or axillary, solitary, or in few-flowered cymes. In high latitudes the species rarely, if ever, produces mature seeds, depending entirely on vegetative reproduction from axillary leaf-buds.

A very variable, polymorphous species, of which the typical form (*S. longipes* s. str.) in our area is represented by four races, none too well-marked:

Sepals glabrous
Flowers in the axils of scarious bracts or scarious-margined leaves — *S. crassipes* Hult. Amphi-Atlantic, arctic. FIG. 29,b. MAP 132.
Flowers in the axils of normal stem leaves, without scarious bracts — *S. monantha* Hult. [*S. Edwardsii* R.Br.] N. American, arctic. FIG. 29,g. MAP 133.
Sepals ciliated, glabrous or pubescent on the back
Flowers in the axils of scarious bracts or scarious-margined leaves. Sepals ciliated — *S. ciliatosepala* Trautv. Circumpolar, high-arctic, alpine. FIG. 29,e. MAP 134.
Flowers in the axils of normal stem leaves; sepals usually pubescent — *S. laeta*, Richards. N. American, arctic. FIG. 29,d. MAP 135.

S. longipes s.lat.: Common or even ubiquitous in a great variety of situations from dry to wet tundra, herbmats, rocky slopes or even the most exposed rocky barrens.

2. **S. humifusa** Rottb.—Fleshy and densely matted perennial with long trailing or ascending, freely rooting stems, bearing numerous somewhat crowded oval-elliptic, flat leaves; flowers solitary in the axils or in few-flowered, leafy cymes.

A common seashore species, which is ubiquitous along sheltered beaches and in brackish or occasionally flooded meadows where it is often associated with turf-forming halophytic sedges and grasses, notably *Puccinellia phryganodes*.

General distribution: Circumpolar, widespread. FIG. 29,c. MAP 136.

3. **S. crassifolia** Ehrh.—Similar but smaller and more delicate in all parts, with flaccid, freely branching and densely matted, slender stems. Leaves narrower, linear-oblong. In the Arctic generally sterile, depending on vegetative reproduction by "bulb-like" wintering buds formed at the end of sterile shoots.

Occasional in wet meadows, where it often forms mats around the bases of tall grasses and sedges.

General distribution: Circumpolar, low-arctic. FIG. 29,f. MAP 137.

2. CERASTIUM L. Mouse-ear Chickweed

Densely matted, pubescent, or glabrate herbs with rather small, oval or oblong leaves and weak flowering stems, bearing one to several white flowers. Petals shallowly notched, except in No. 5.

Entire plant or at least flowering stems, peduncles and sepals glandular-viscid
Entire plant more or less clammy; basal leaves villous-lanate, especially toward the tips — 1. *C. alpinum*
Plant not clammy; basal leaves short pilose to hirsute or even glabrate — 2. *C. Beeringianum*
Plant pilose or glabrous but not glandular viscid; dwarf species
Peduncles, stems and the upper leaf surfaces hirsute — 3. *C. arcticum*
Entire plant glabrous or essentially so
Styles 5 — 4. *C. Regelii*
Styles 3 — 5. *C. cerastoides*

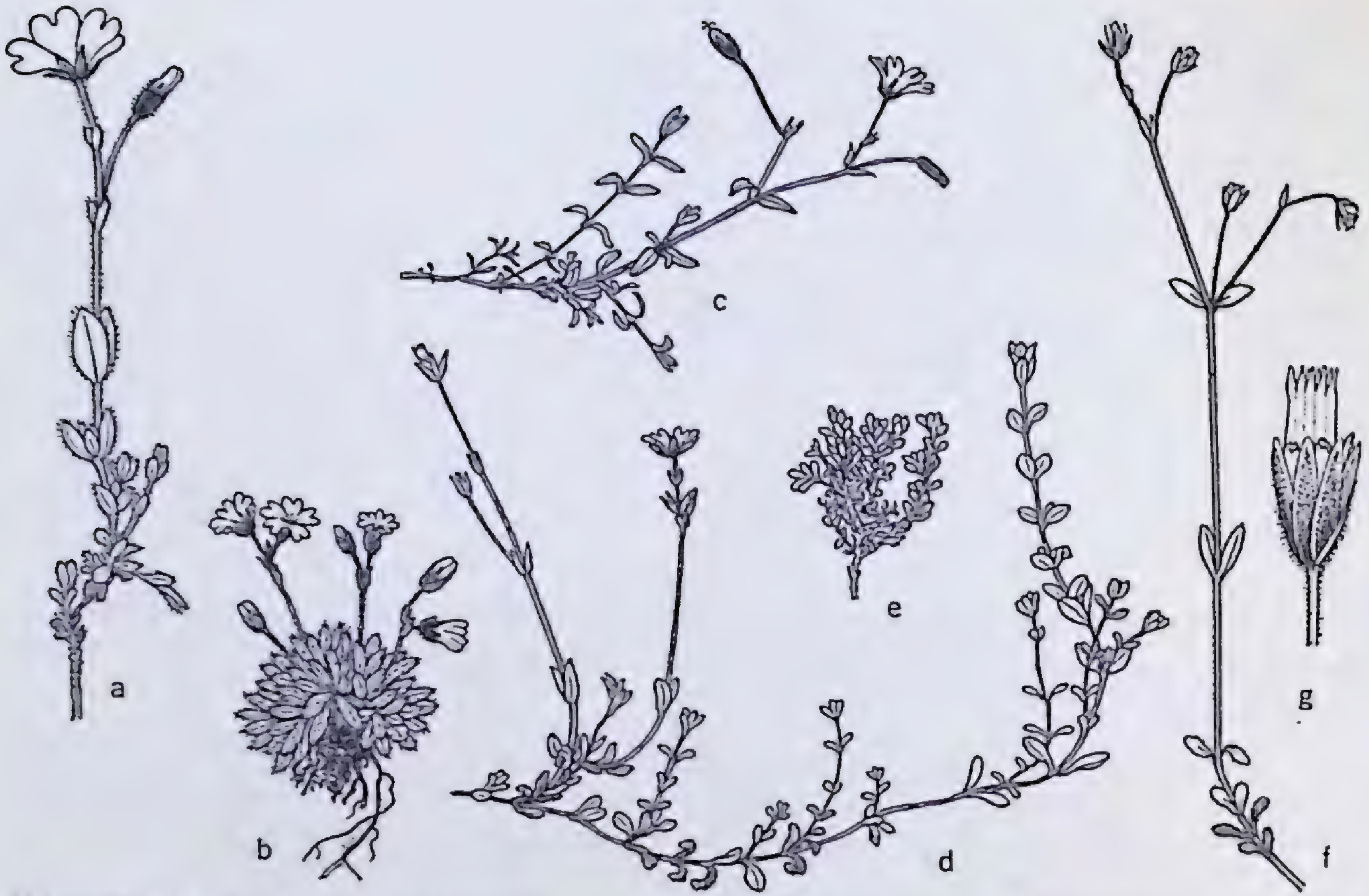

FIGURE 30. a. *Cerastium alpinum.* b. *C. arcticum.* c. *C. cerastoides.* d, e. *C. Regelii.* f, g. *C. Beeringianum.* (1/2; g 3/2)

1. **C. alpinum** L.—A variable species which, as a rule, may be readily distinguished by its matted growth and densely lanate-villous and glandular-viscid or even clammy basal leaves and flowering stems. The flowering stems are weak, bearing one to several flowers; sepals usually green, much shorter than the petals.

In rocky, sandy, or gravelly places, frequently on manured soil or bird cliffs and near human habitations.

General distribution: Amphi-Atlantic, arctic. FIG. 30,a. MAP 138.

2. **C. Beeringianum** Cham. & Schlecht.—Similar, but less densely matted and lacking the long, lanate pubescence and clammy viscid pubescence so characteristic of typical *C. alpinum.* The flowering stems are stiffer and often repeatedly forking, bearing from a few to a dozen flowers; these are smaller than in *C. alpinum,* and the sepals are usually brownish-purple and only slightly shorter than the petals.

In similar places as the preceding.

General distribution: Western N. America and E. Asia, extending from Alaska eastward through Yukon and the Mackenzie District. Less common in the Eastern Arctic, where it seems restricted chiefly to calcareous soils. Lacking in Greenland. FIG. 30,f,g. MAP 139.

3. **C. arcticum** Lge.—Low and densely caespitose perennial with decumbent stems and ovate-suborbicular leaves, which are glabrous below and densely hirsute above. Flowering stems erect, 2 to 5 cm. high, densely hirsute but not glandular-viscid, bearing 1 or 2 comparatively large flowers.

Sepals greenish-purple, three-quarters as long as the petals. Occasional on limestone barrens or in clay spots in tundra. Probably always restricted to calcareous soils.

General distribution: Endemic of the Arctic Archipelago and northernmost Greenland. FIG. 30,b. MAP 140.

4. **C. Regelii** Ostf.—Essentially glabrous, loosely caespitose or matted perennial, usually with trailing, long-internoded, freely branching and rooting stems, somewhat of the habit of *Cerastium cerastoides*, but in exposed situations a dense and almost pulvinate and always sterile form occurs with extremely short internodes and closely imbricated leaves. Leaves oblanceolate-ovate to sub-orbicular, 5 to 12 mm. long, somewhat fleshy, glabrous on both sides or sparingly and softly ciliated along the margins, often subtending axillary fascicles or elongate shoots terminating in wintering buds. The marcescent and bleached leaves persist on the stems for several years, and often only the growing tips of each shoot are fresh and green. The species apparently reproduces chiefly by vegetative buds, and flowers are rarely if ever seen, except near the southern edge of its range. When present, the flowering axes are prostrate and may be 15 to 20 cm. long, with internodes 5 to 8 cm. long. The inflorescence consists of from 1 to 4 flowers on finely pubescent peduncles 1 to 4 cm. long; sepals soft pubescent, about 5 mm. long, greenish purple, two-thirds as long as the shallowly notched petals. Mature capsules 10 mm. long, opening with 10 teeth.

Common or even ubiquitous in wet swales in low, calcareous tundra, on low lake shores and in low places in general, where the snow remains late. The pulvinate form is generally found in wet clay on frost-activated limestone barrens.

General distribution: Amphi-Atlantic, high-arctic. FIG. 30,d,e. MAP 141.

5. **C. cerastoides** (L.) Britt.—Matted and nearly glabrous perennial with prostrate and freely forking stems and fleshy, narrow, light green, somewhat shiny leaves. Flowers mostly solitary, axillary near the tips of the stems; the petals twice as long as the sepals, deeply notched. Capsule twice as long as the calyx.

In moist herbmats.

General distribution: Amphi-Atlantic, subarctic-alpine. FIG. 30,c. MAP 142.

3. SAGINA L. Pearlwort

Small tufted herbs with filiform, subulate leaves, and small, inconspicuous terminal or axillary flowers. Petals 4 or 5, or none, white, entire or notched. Styles as many as the sepals. Capsule many-seeded, 4 or 5 valved.

Flowers normally 5-merous	
Petals inconspicuous; upper leaves of flowering branches slender, not subtending leafy bulbils in their axils	1. *S. caespitosa*
Petals large, twice as long as the sepals; upper leaves of flowering branches subtending small, firm bulbils	2. *S. nodosa*
Flowers normally 4-merous	3. *S. intermedia*

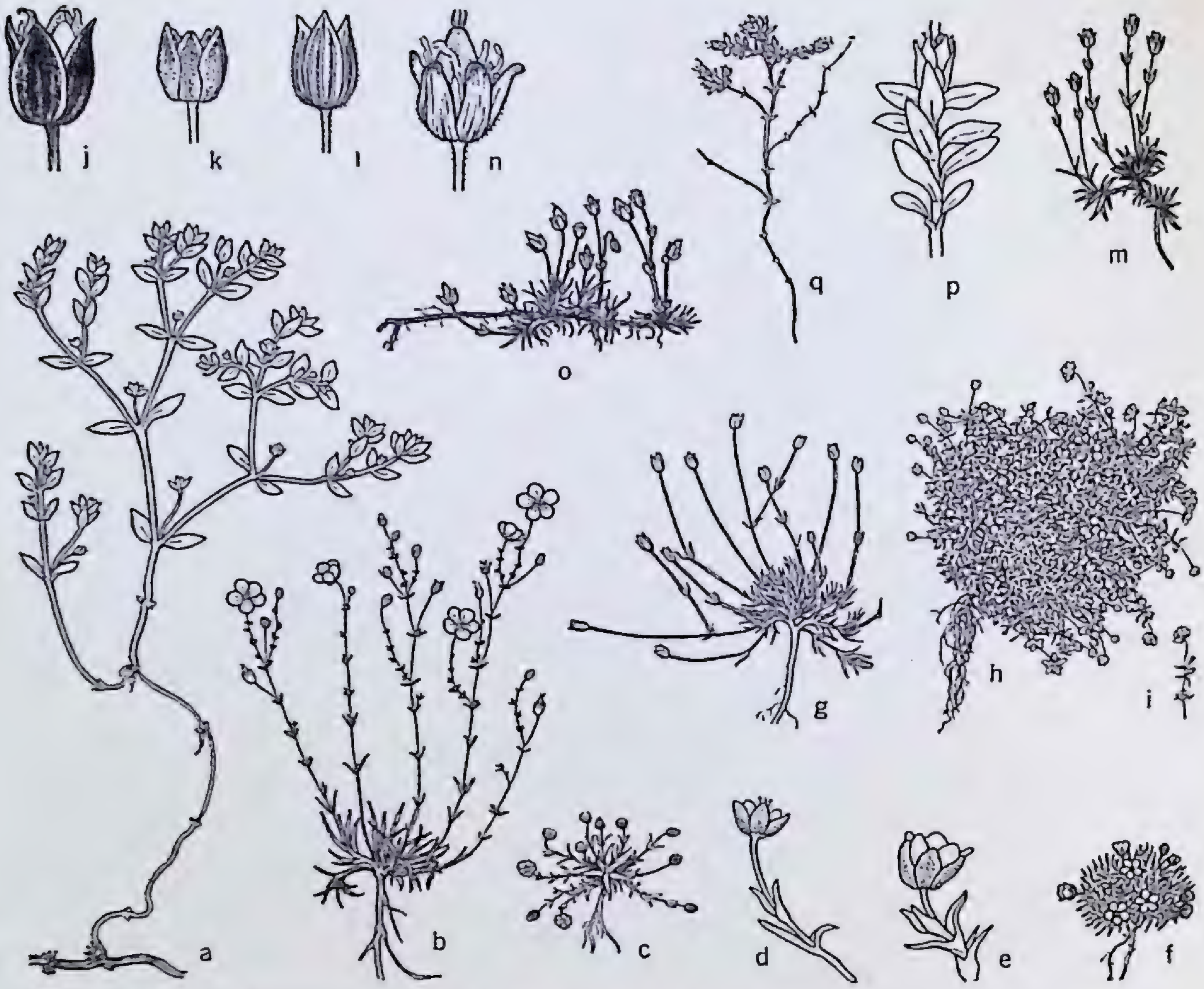

FIGURE 31. a. *Arenaria peploides* var. *diffusa*. b. *Sagina nodosa*. c, d. *S. intermedia*. e, f. *S. caespitosa*. g, j. *Arenaria uliginosa*. h, i, k. *A. Rossii*. l, m. *A. rubella*. n, o. *A. sajanensis*. p, q. *A. humifusa*. (1/2; d, e, p 2/1; j, k, l, n. 4/1)

1. **Sagina caespitosa** (J. Vahl) Lge.—Glabrous, dwarf, perennial forming, small, reddish-green, rather compact, hemispherical tufts from a few to 6 or 8 cm. in diameter. The solitary, erect, short peduncled, globular flowers are 2 to 3 mm. in diameter and the entire and white petals slightly longer than the sepals. Stamens 10.

Occasional or rare, but perhaps often overlooked, in moist gravelly places.

General distribution: Amphi-Atlantic, arctic. FIG. 31,e,f. MAP 143.

S. Linnaei Presl.; *S. saginoides* (L.) Karst.—Caespitose, with procumbent, yellowish-green stems that root at the nodes. Flowers long-pedunculate, nodding when young; petals 5, rarely 4.

Edge of snowbeds, in moist sand or moss by brooks. Circumpolar, low-arctic.

2. **S. nodosa** (L.) Fenzl.—Tufted glabrous or sparingly glandular-hirtellous perennial with simple or freely branched, capillary stems up to 20 cm. long, bearing numerous bulb-like fascicles of axillary, reduced leaves; sometimes

entirely lacking flowers, or more commonly with each branch terminating in a single flower. Petals 5, about twice as long as the sepals.

Moist, gravelly or peaty soil.

General distribution: Amphi-Atlantic, low-arctic. FIG. 31,b. MAP 144.

3. **S. intermedia** Fenzl.—Dwarf glabrous perennial, forming small, flat or depressed, and usually reddish-green tufts, one to a few centimetres in diameter, with spreading or ascending, 1-flowered stems radiating from the tuft. Petals 4, white, barely longer than the sepals. Stamens 4 or 5.

Occasional to common in moist sand or gravel by lake shore or in wet clay in open tundra.

General distribution: Circumpolar, arctic-alpine. FIG. 31,c,d. MAP 145.

4. ARENARIA L. Sandwort

Small tufted or matted herbs with sessile leaves, small flowers, usually with 5 sepals, 5 entire or barely notched white petals, and 10 stamens.

Leaves lanceolate-elliptic	
Coarse, matted seashore plants with fleshy, yellowish-green leaves and stems	1. *A. peploides*
Dwarf, with filiform creeping, mostly subterranean stems	2. *A. humifusa*
Leaves linear subulate or bristle-like	
Leaves prominently 3-nerved; leaves and stems glandular-hirtellous	3. *A. rubella*
Leaves 1-nerved or appearing nerveless	
Stems and leaves glabrous	
Low and depressed; stems strictly one-flowered	4. *A. Rossii*
Tufted, with stiffly erect and one- to several-flowered stems	5. *A. uliginosa*
Stems minutely glandular above, densely matted	6. *A. sajanensis*

1. **A. peploides** L. var. **diffusa** Hornem.; SEABEACH-SANDWORT—Glabrous, fleshy perennial with much branched and freely rooting stems deep in sand. Leaves elliptic or oblong-lanceolate. Flowers in terminal, few-flowered, leafy cymes or from the upper leaf axils. Petals white, inserted on a conspicuous 10-lobed disk; capsule globular, leathery, 6 to 12 mm. in diameter, containing 5 or 6 large, smooth seeds.

Common and ubiquitous along sandy beaches. The succulent young shoots of the seabeach sandwort may be eaten raw as a salad, cooked as a pot-herb or preserved as pickle or *sauerkraut*. The cooked or ensilaged plant may be used as fodder for pigs and sheep.

General distribution: Circumpolar, low-arctic. FIG. 31,a. MAP 146.

2. **A. humifusa** Wahlenb.—Low, tufted or loosely matted perennial with filiform subterranean creeping stems; leaves generally imbricated, lanceolate or oblanceolate, glabrous and somewhat fleshy, 2 to 10 mm. long. Flowering stems decumbent or ascending, usually only a few centimetres high, remotely leafy, puberulent above, one- or rarely few-flowered. Sepals oblong, obtuse, nerveless, about as long as the white petals. Capsule cylindric, longer than the calyx; seeds lustrous and faintly rugulose.

Moist calcareous gravels or in moist rock crevices.

General distribution: N. American, widespread, arctic-alpine. FIG. 31,p,q. MAP 147.

3. **A. rubella** (Wahlenb.) Sm.; *Minuartia rubella* (Wahlenb.) Hiern.—Low, glandular-hirtellous, tufted or matted perennial. Leaves linear-subulate, crowded on the basal shoots, prominently 3-nerved, and from 3 to 5 mm. long. Flowering stems decumbent at the base, erect-ascending, filiform, usually 3 to 6 cm. long and one- several-flowered. Sepals lanceolate-acuminate, 3-nerved, greenish-purple, slightly longer than the entire, white petals, but slightly shorter than the capsule.

Common in dry, gravelly, sandy or rocky places.

General distribution: Circumpolar, arctic-alpine. Fig. 31,l,m. Map 148.

4. **A. Rossii** R. Br.; *Minuartia Rossii* (R. Br.) House—Low, glabrous and loosely caespitose, matted, perennial with crowded, 3 to 5 mm. long, linear, obtuse, somewhat fleshy and prominently keeled leaves. Flowering stems, spreading and always 1-flowered, the peduncles filiform, usually about 1 to 1.5 cm. long; sepals lanceolate, obscurely 3-nerved, dark purple, spreading in anthesis, slightly shorter than the linear-oblong white petals. Capsules slightly longer than the sepals. In the Far North the reproduction may be largely vegetative by axillary or terminal and easily detached leaf buds. Common in not too dry, turfy, gravelly or sandy calcareous barrens.

General distribution: N. American, high-arctic, alpine. Fig. 31,h,i,k. Map 149.

5. **A. uliginosa** Schleich.; *Minuartia stricta* (Sw.) Hiern., not *Arenaria stricta* Michx.—Similar to *A. Rossii*, but more loosely tufted; the flowering stems 5 to 10 cm. high, stiffly erect, simple or branched above, usually 2- to 3-flowered. Sepals not spreading in anthesis.

Occasional in rather damp and mossy tundra, frequently growing on the sides of mossy hummocks and by the edge of frost polygons.

General distribution: Circumpolar, arctic, but in N. America an eastern species with an Amphi-Atlantic type of range. Fig. 31,g,j. Map 150.

6. **A. sajanensis** Willd.; *Minuartia biflora* (L.) Schinz. & Thell.—Densely matted with widely creeping, firm, and almost sub-ligneous stems with crowded, 5 to 10 mm. long, somewhat fleshy, flat, linear and obtuse fresh green leaves. Flowering stems minutely glandular-hirtellous above, 1- to 3-flowered. Sepals linear-oblong, obtuse and prominently 3-nerved, distinctly shorter than the oblanceolate, pure white petals.

On favourably exposed calcareous grassy slopes and herbmats having abundant snow-cover in winter.

General distribution: Circumpolar, low arctic. Fig. 31,n,o. Map 151.

A. nardifolia Ledeb.—Densely tufted from a somewhat woody base; leaves filiform, 2 to 8 cm. long, in dense fascicles; flowering stems smooth, erect or ascending, terminating in a cluster of small flowers.

Calcareous, warm, south-facing slopes. Alaska, Yukon; Asia.

5. Silene L. Campion

S. acaulis L. var. **exscapa** (All.) DC.; Moss-Campion—Caespitose, glabrous perennial, forming compact, hemispherical, or flat cushions up to 50 cm. or more in diameter. The densely crowded branches are clothed

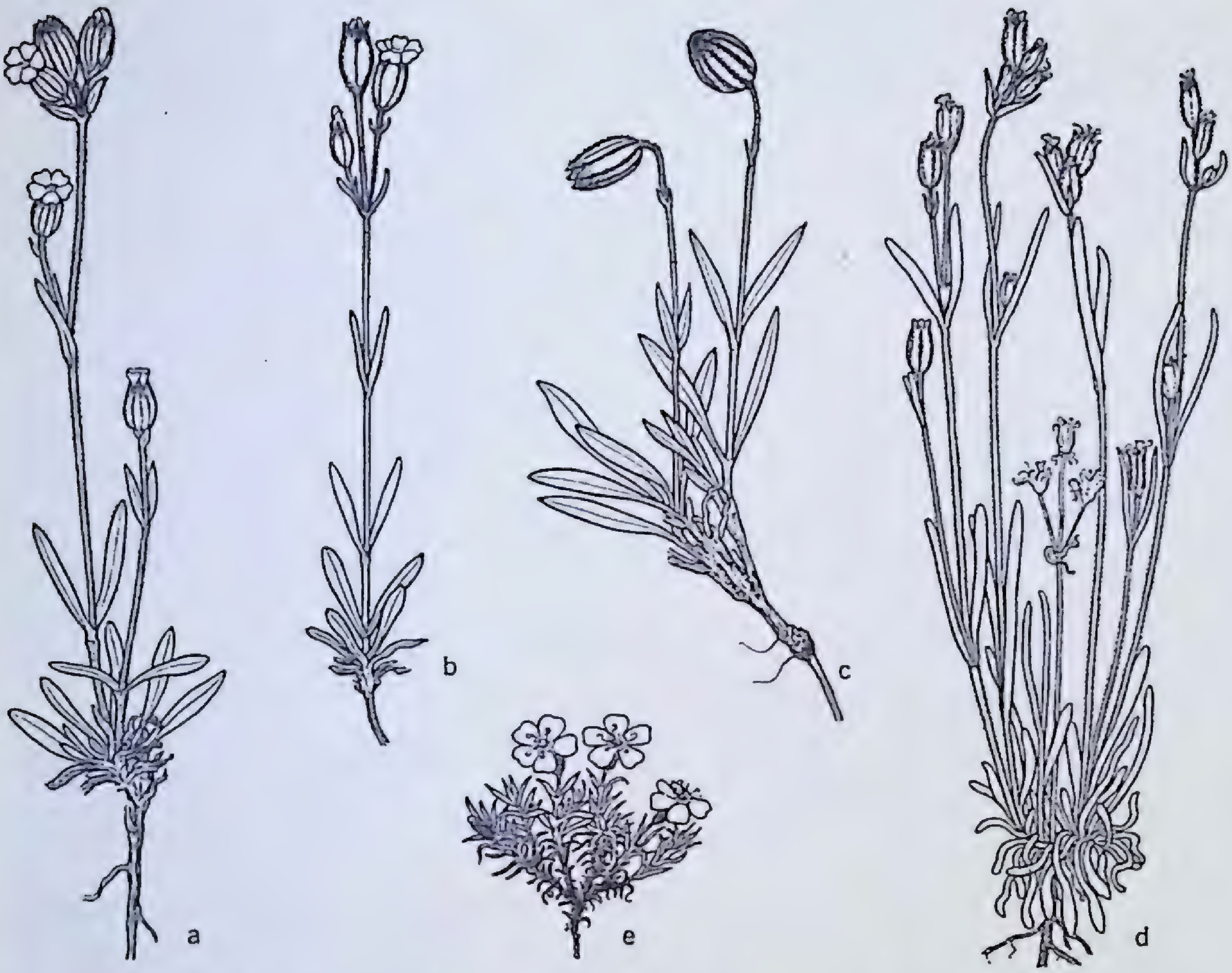

FIGURE 32. a. *Melandrium triflorum.* b. *M. affine.* c. *M. apetalum* ssp. *arcticum.* d. M. *Ostenfeldii.* e. *Silene acaulis* var. *exscapa.* (1/2)

with marcescent linear leaves and terminate in a single, short-peduncled, monoecious or perfect flower. Calyx tubular, glabrous; petals pink, lilac or pale purple, rarely pure white (f. *albiflora*); capsule twice as long as the calyx.

The moss-campion is common throughout the Arctic where its firm, moss-like tussocks may be found on well-drained gravelly or turfy barrens, or on cliffs or rocky ledges.

General distribution: *S. acaulis* s.lat.: Circumpolar, arctic-alpine. FIG. 32,e. MAP 152.

6. MELANDRIUM Roehl. Bladder-Campion

Perennial herbs with a strong tap-root; opposite, oblanceolate, mostly basal leaves, and erect, slender, one- to several-flowered stems. Calyx large, more or less inflated, prominently striped or nerved; petals inconspicuous, often included, 2-cleft, white, pale pink or purple; styles 5; stamens 10, alternating with the petals. Ovary one-celled; capsule opening with 5 or 10 reflexed teeth, containing numerous seeds. [*Wahlbergella* Fries; *Lychnis* Am. auth., in part.]

Flowers solitary, nodding during anthesis; calyx prominently inflated, petals barely exserted; capsule opening with 10 teeth, seeds large and broad-winged — 1. *M. apetalum* ssp. *arcticum*

Flowers several, erect in anthesis, calyx not prominently inflated, petals exserted; capsule opening with 5 teeth, seeds small, narrow-winged or wingless, and angular
- Calyx ovoid
  - Petals milky white, seeds with a narrow wing — 2. *M. affine*
  - Petals pale pink, seeds wingless, angular, the seed-coat tuberculate or muricate — 3. *M. triflorum*
- Calyx sub-cylindrical; seeds small, wingless, angular, and granular — 4. *M. Ostenfeldii*

1. **M. apetalum** (L.) Fenzl. ssp. **arcticum** (Fr.) Hult.—Basal leaves linear oblong to oblanceolate, obtuse, crowded around the base of the stems. Flowering stems simple, somewhat flexuous, purplish and short pubescent above, usually from 5 to 12 cm. high, with one or two pairs of sessile linear leaves. The solitary, large flower is nodding during anthesis, but as the capsule matures it becomes erect. The inflated, bladder-like ovoid or almost globular, purple-striped, translucent, papery calyx resembles a miniature Japanese lantern. The short-exserted petals are purple; the seeds reniform or circular in outline, 1.5 to 2.4 mm. in diameter, including the somewhat swollen and prominent wing.

Common in wet tundra, in moist meadows along lagoons and lake shores, in moss by alpine brooks, or in wet clay on gravelly barrens.

General distribution: Circumpolar, high-arctic. Fig. 32,c. Map 153.

2. **M. affine** (J.Vahl) Hartm.; *M. furcatum* (Raf.) Hult.—Similar, but flowering stems stiffly erect, stouter, 5 to 30 cm. high, somewhat glandular-viscid and usually bearing 2 or 3 pairs of prominent, lanceolate leaves. Inflorescence in few-flowered cymes, usually of 3 erect flowers on short, erect peduncles that rapidly elongate toward maturity. The calyces are ovoid, somewhat glandular-viscid, barely inflated; the petals milky white and much exserted. The seeds small, reniform, less than 2 mm. in diameter with a narrow wing.

Common in not too dry, stony, gravelly, or sandy places, rarely in moist grassy situations.

General distribution: N. American, arctic. Fig. 32,b. Map 154.

3. **M. triflorum** (R. Br.) J. Vahl—Similar, but flowering stems stouter and stiffer and the upper part of the calyx even more glandular-viscid. Flowers mostly 3, often almost sessile or very short peduncled. Petals pale pink, considerably exserted but soon wilting. Seeds small, 1 mm. or less in diameter, wingless and angular, the seed-coat conspicuously granulate-muricate.

On calcareous clay and gravel of fresh moraines and stony barrens of the northernmost islands of the Archipelago.

General distribution: Endemic of northern E. and W. Greenland and the northernmost islands of the Archipelago. Fig. 32,a. Map 155.

4. **M. Ostenfeldii** Porsild—Densely caespitose often with a very stout tap-root terminating in a much-branched crown. Basal leaves linear-spatulate. Flowering stems somewhat flexuous, 10 to 30 cm. high, 1- to

8-flowered, glandular-viscid above, with 2 to 3 pairs of linear leaves. Calyx sub-cylindrical, glandular-viscid, and with broad greenish stripes. Petals narrow, much exserted and deeply notched, white or pale pink. Seeds about 0.8 × 0.6 mm, angular, wingless, dark brown, and granulate.

On sunny, calcareous cliffs, ledges, or talus slopes.

General distribution: Endemic of N.W. America and thus far known only from mountains of S.E. Yukon, Great Bear Lake, and S.W. Victoria Island. Fig. 32,d. Map 156.

Viscaria Bernh.

V. alpina (L.) G. Don.; *Lychnis alpina* L.; Alpine Campion—Perennial with dense rosettes of spatulate-linear basal leaves and stiffly erect flowering stems terminating in a cyme of pink scented flowers.

Herbmats and south-facing gravelly slopes. E. Arctic. Amphi-Atlantic.

14. RANUNCULACEAE Crowfoot Family

Ours perennial herbs with colourless, acrid juice and alternate simple or compound leaves without stipules, but often with the petioles dilated at the base. Flowers symmetrical, polypetalous, or apetalous with petaloid calyx. Fruit an achene, or a many-seeded pod or follicle opening along one side.

Carpels with several ovules, forming follicles	
Follicles sessile; leaf-blades entire or merely toothed	1. Caltha
Follicles stipitate; leaf-blade ternately divided	2. Coptis
Carpels 1-ovuled; fruit of achenes borne in heads or in dense, short-cylindric spikes	
Petals wanting, sepals petaloid	
Styles short, not plumose	3. Anemone
Styles long, plumose	4. Pulsatilla
Petals regularly present, sepals 3 or 5	5. Ranunculus

1. Caltha L. Marsh-Marigold

C. palustris L. var. **arctica** (R. Br.) Huth.—Glabrous perennial marsh plant with reclining stems often rooting at the nodes, and long-petioled, cordate or reniform leaves. Flowers solitary in the axils of the subsessile cauline leaves, 1.5 to 2.5 cm. in diameter. Sepals petaloid, pale yellow, often purplish on the back, petals wanting. Fruiting heads turbinate, composed of 10 to 12 compressed and ascending follicles.

Growing in shallow water or in wet marshy places, often among tall grasses or sedges. Apparently an arctic and western race of *C. palustris*, lacking in the eastern Canadian Arctic and in Greenland.

General distribution: E. Asia and arctic N.W. America. Fig. 33,a. Map 157.

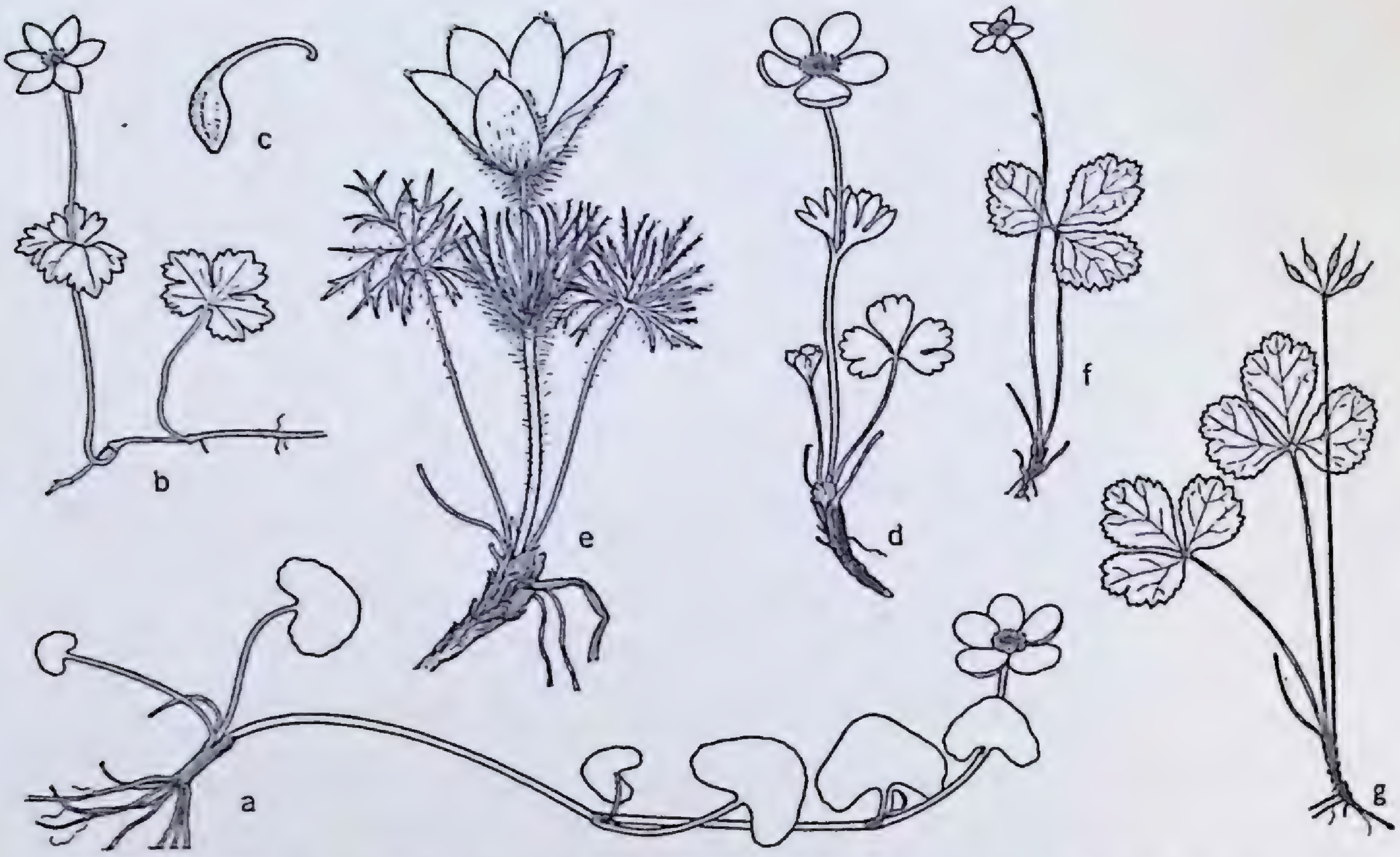

FIGURE 33. a. *Caltha palustris* var. *arctica*. b, c. *Anemone Richardsonii*. d. *A. parviflora*. e. *Pulsatilla Ludoviciana*. f, g. *Coptis trifolia*. (2/5; c 3/2)

2. COPTIS L. Goldthread

C. trifolia (L.) Salisb. ssp. **groenlandica** (Oed.) Hult.—Dwarf perennial with thread-like bright yellow rhizomes, evergreen, lustrous, and slender-petioled 3-nate leaves and solitary white flowers on filiform scapes 3 to 10 cm. high. Flowers 1.0 to 1.5 cm. in diameter; sepals petaloid, narrowly oblanceolate, white; petals inconspicuous and yellowish-green, about one-third as long as the sepals. Follicles spreading on slender stalks, each containing about 3 large and glossy black seeds.

In sheltered turfy places or in leaf mould under willows. Thus far, known in our area only from a single station in Frobisher Bay, S. Baffin Island.

General distribution: Subarctic eastern N. America. Greenland. FIG. 33,f,g. MAP 158.

3. ANEMONE L. Anemone

Herbs with horizontal rootstocks and erect peduncles. Basal leaves palmately divided, petiolate; those of the stem similar but sessile and whorled, forming an involucre far below the flower. In ours the flower is terminal and solitary.

1. **A. parviflora** Michx.—Rootstocks slender, dark fibrillose, terminating in rosettes of dark green ternate and lustrous leaves and solitary flowering stems 10 to 20 cm. high. Flowers 2 to 3 cm. in diameter, the sepals pure white above, silky and tinged with blue beneath. Fruiting head spherical; achenes woolly.

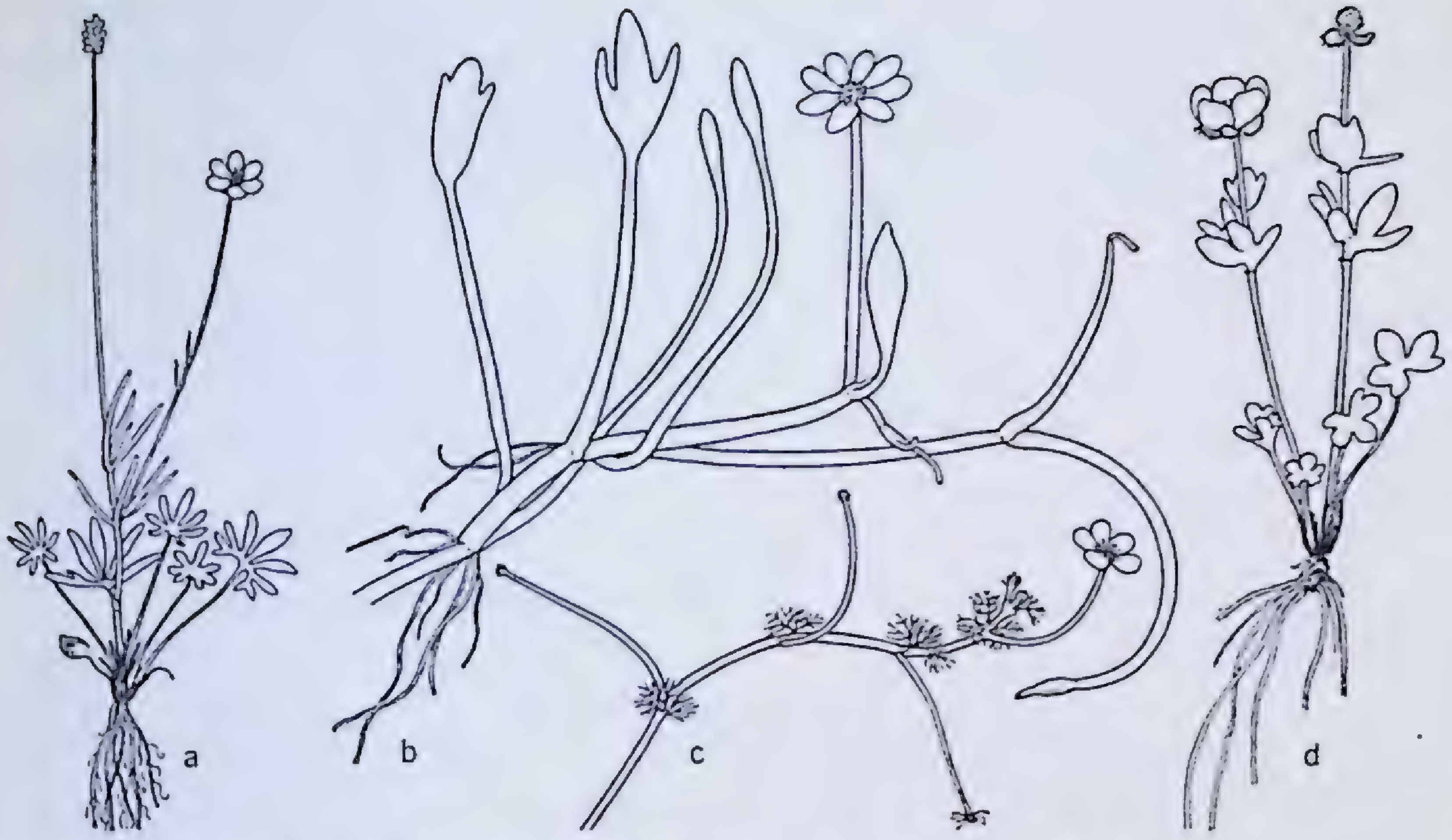

FIGURE 34. a. *Ranunculus pedatifidus* var. *leiocarpus*. b. *R. Pallasii*. c. *R. subrigidus*. d. *R. nivalis*. (2/5)

A subarctic species which in our area is restricted to southern and favourable exposures and to calcareous soil. Thus far not recorded from the eastern islands. Lacking in Greenland.

General distribution: N. America and E. Asia: Subarctic-alpine. FIG. 33,d. MAP 159.

2. **A. Richardsonii** Hook.—Slender and delicate, sparingly hirsute with filiform rootstocks and deeply 5-cleft basal leaves; the involucral ones similar but 3-cleft. Scapes 5 to 20 cm. high, solitary, flowers 1.5 to 2.5 cm. in diameter; sepals yellow, fruiting heads subglobose, and the achenes few and glabrous with a slender, hooked beak.

A subarctic species of moist herbmats and willow thickets, which barely enters our area.

General distribution: E. Asia, N. America, and W. Greenland: Subarctic-alpine. FIG. 33,b,c. MAP 160.

4. PULSATILLA Pers. Pasque-flower

P. Ludoviciana (Nutt.) Heller—Tufted perennial with a stout, branched, vertical rootstock. Basal leaves long-petioled, in a rosette, the blade bipinnate, the leaflets pinnately divided into long, linear segments; the stem-leaves sessile, deeply cleft into linear lobes. All leaves, including the slender petioles of the basal leaves long silky-villous. Flowers solitary, terminal; the sepals 5 to 7, purple, 3 to 5 cm. long and spreading; the styles plumose, rapidly elongating and becoming 2 to 3 cm. long in fruit, resembling those of *Dryas*.

The pasque-flower grows in sandy and well-drained soil where its large and showy flowers appear soon after the snow disappears. The peduncles elongate rapidly and in fruit may be up to 50 cm. high.

General distribution: Cordilleran foothills and plains. North through western Mackenzie, Yukon to Alaska. FIG. 33,e. MAP 161.

5. RANUNCULUS L. Buttercup. Crowfoot

Ours perennial herbs with alternate, entire, lobed, divided, or dissected leaves. Sepals 3 or 5, deciduous, petals 5 or more, yellow or white. Achenes flattened, smooth, tipped with the persistent style.

- a. Stoloniferous; flowers yellow or white
  - b. Aquatic or amphibious plants with creeping of floating stems rooting at the nodes
    - c. Totally submersed, with finely divided leaves and white, sometimes emerging flowers
      - d. Submersed leaves flaccid — 1. *R. tricophyllus* var. *eradicatus*
      - d. Submersed leaves more rigid and stiff — 2. *R. subrigidus*
    - c. Amphibious plants, flowers yellow or white
      - e. Primary divisions of leaves entire; sepals 3
        - f. Flowers white, about 2 cm. in diameter; coarse fleshy plants — 3. *R. Pallasii*
        - f. Flowers yellow and small; low, creeping, and densely matted — 4. *R. hyperboreus*
      - e. Primary divisions of leaves again divided into linear segments; flowers yellow, sepals 5 — 5. *R. Gmelini*
  - b. Terrestrial plants with yellow flowers
    - g. Scapose — 6. *R. lapponicus*
    - g. Decumbent and stoloniferous, rooting at the nodes — 7. *R. Cymbalaria*
- a. Caespitose, scapiform plants with yellow flowers
  - h. Sepals densely black or brown, hairy
    - i. Receptacle naked — 8. *R. nivalis*
    - i. Receptacle hairy — 9. *R. sulphureus*
  - h. Sepals glabrous, glabrate, or short, yellowish pubescent
    - j. Basal leaves all deeply lobed or cleft
      - k. Plants 10–25 cm. high, with 1- to several-flowered stems — 10. *R. pedatifidus*
      - k. Plants 3–10 cm. high, stems 1-flowered
        - l. Flowering stems slender and weak, more or less flexuous or reclining — 11. *R. pygmaeus*
        - l. Flowering stems rather stout, stiffly erect — 12. *R. Sabinei*
    - j. Basal leaves suborbicular to reniform, merely crenate or very shallowly lobed; flowering stems slender, somewhat flexuous — 13. *R. Allenii*

1. **R. trichophyllus** Chaix var. **eradicatus** (Laest.) W. B. Drew; *R. confervoides* Fr.; *R. aquatilis* L. var. *eradicatus* Laest.; WHITE WATER-BUTTERCUP—Totally submersed, much-branched aquatic, with finely divided flaccid leaves, which collapse when withdrawn from water; leaf blades flabelliform or orbicular with a short petiole. The mostly submerged but sometimes floating flowers are solitary on peduncles 1 to 6 cm. long, the petals pure white, 2 to 3 times as long as the sepals. The achene in this and the following species characteristically transversely wrinkled.

In shallow ponds or sometimes in running water, less commonly in brackish lagoons.

General distribution: Circumpolar, low-arctic. FIG. 35,l. MAP 162.

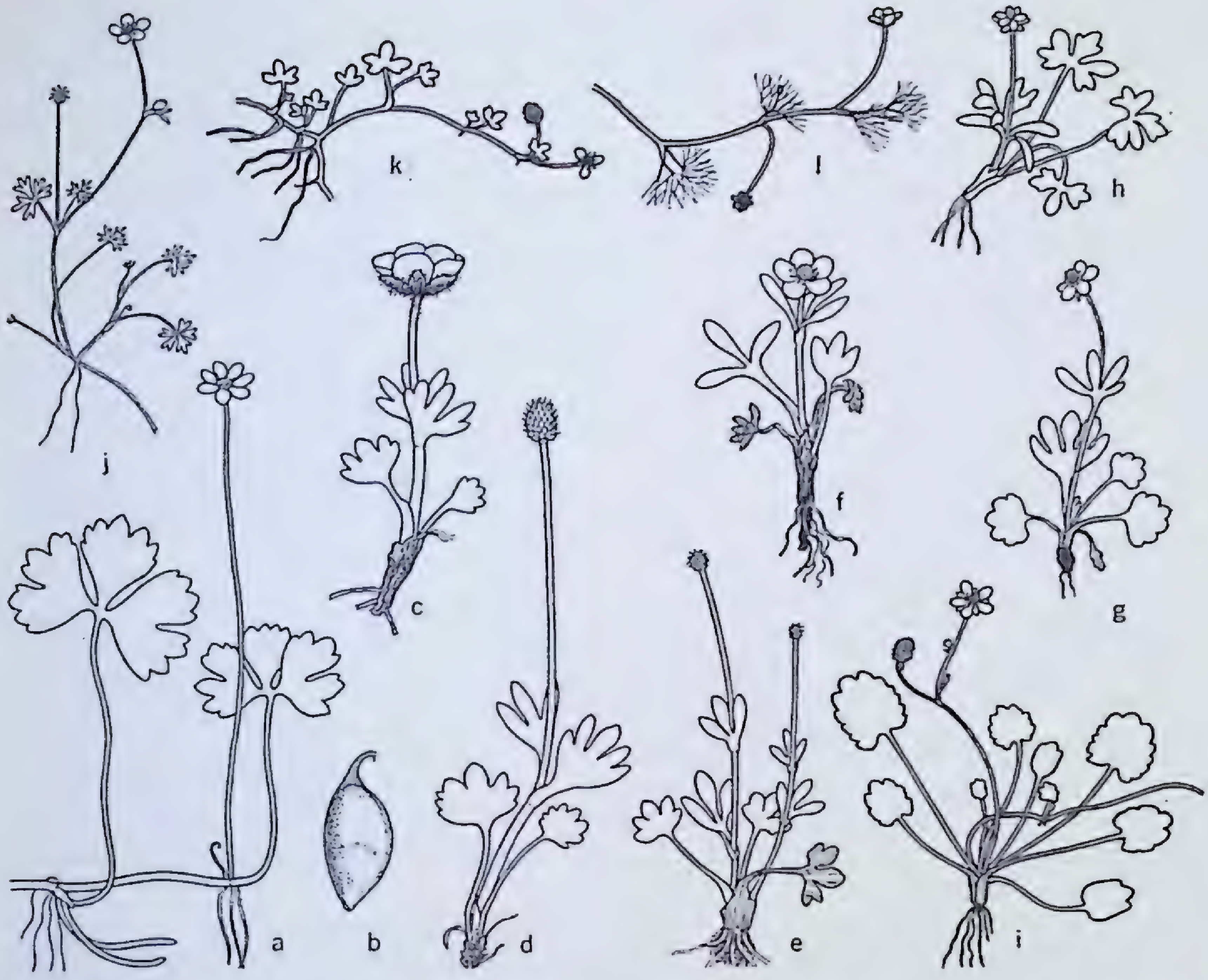

FIGURE 35. a, b. *Ranunculus lapponicus.* c, d. *R. sulphureus.* e, f. *R. Sabinei.* g. *R. Allenii.* h. *R. pygmaeus.* i. *R. Cymbalaria.* j. *R. Gmelini.* k. *R. hyperboreus.* l. *R. trichophyllus* var. *eradicatus.* (1/2; b 3/2)

2. **R. subrigidus** W. B. Drew.; *R. circinatus* Sibth. var. *subrigidus* W. B. Drew—Similar to No. 1, but the submersed leaves are stiffer and hold their shape when removed from the water.

In shallow, calcareous ponds.

General distribution: N. America, subarctic. FIG. 34,c. MAP 163.

3. **R. Pallasii** Schlecht.; PALLAS'S BUTTERCUP.—Glabrous and somewhat fleshy marsh plant with a creeping and freely branched stem, rooting at the nodes. Basal leaves with 10 to 30 cm. long petioles and deeply cleft, ternate or sometimes simple blades. Flowering stems erect-ascending, bearing one or two reduced leaves and one or rarely two long-pedunculate flowers from the leaf axils. Flowers strongly perfumed, 1.5 to 2.5 cm. in diameter, with 6 to 10 elliptic-oblong, pure white petals. Fruiting heads globose; the plump achenes 4.5 to 5.5 mm. long, including the short beak.

Wet, brackish meadows and sloughs along the seacoast.

General distribution: Circumpolar, low-arctic, with several large gaps. FIG. 34,b. MAP 164.

4. **R. hyperboreus** Rottb.—Low, creeping, densely matted amphibious plant with small, deeply 3-lobed leaves and solitary yellow flowers from the leaf axils. Fruiting heads globular about 4 mm. in diameter.

Common in shallow fresh or brackish water, frequently growing among tall sedges and grasses by the edge of ponds.

General distribution: Circumpolar, arctic-alpine. Fig. 35,k. Map 165.

5. **R. Gmelini** DC.—Similar, but a more pronounced aquatic, with floating and submersed, orbicular-reniform leaves with 3 to 5 cuneate lobes, each again divided into 2 to 3 linear divisions.

In shallow fresh-water ponds, often among the bases of sedges and grasses in wet boggy places or by the margins of ponds.

General distribution: Eurasia and N.W. America, low-arctic. Fig. 35,j. Map 166.

R. reptans L.; Creeping Spearwort—Stems filiform, arching between the rooting nodes. Leaves tufted, linear, and bladeless; flowers small, yellow, and usually solitary.

Moist clay or sand along the shores of ponds or lagoons. Circumboreal.

6. **R. lapponicus** L.; Lapland Buttercup—Terrestrial, with filiform creeping stems, deeply buried in moss, freely rooting from the nodes, and bearing slender simple or forking scapose or 1-leaved flowering stems from a few to 25 cm. high; basal leaves solitary or a few together, slender and long-petioled, reniform and deeply 3-cleft, the lobes broadly obovate and coarsely crenate. Flowers solitary, sweet-scented, about 1 cm. in diameter, with 3 sepals and from 6 to 10 pale yellow or whitish petals. Fruiting head globular of from 3 to 15 achenes, each slightly longer than the slender and hooked style.

In damp moss, often under willows or in sphagnum bogs.

General distribution: Nearly circumpolar, low-arctic. Fig. 35,a,b. Map 167.

7. **R. Cymbalaria** Pursh var. **alpinus** Hook.; Northern Seaside Buttercup—Low caespitose, glabrous, and somewhat fleshy with widely trailing runners, rooting freely at the nodes. Leaves long-petioled, the blade reniform-ovate, from 5 to 25 mm. long, crenately toothed or shallowly lobed. Scapes one- to several-flowered, from a few to 20 cm. long; flowers 5 to 9 mm. in diameter with bright yellow, narrowly oblanceolate petals. Fruiting head short-cylindrical; the achenes small, obovate, longitudinally nerved, and with a short, erect beak.

Saline or brackish shores in moist clay or sand.

General distribution: E. Asia and subarctic N. America. Fig. 35,i. Map 168.

8. **R. nivalis** L.; Snow-Buttercup—Tufted, from a short fibrous caudex with from a few to several slender, erect, 1- to 3-leaved flowering stems. Basal leaves petioled, their blades reniform, deeply 3-lobed, each lobe cleft half-way to the base. Flowering stems 5 to 10 cm. high, much elongated in fruit; the flowers 1.5 to 2.5 cm. in diameter, sepals 5, densely brownish-black villous on the back, petals 5, dark yellow, twice as long as the sepals. Fruiting head ovoid to short-cylindrical; the receptacle naked; achenes 1.5 to 2.0 mm. long with a short beak.

In wet moss by brooks and in herbmats, often near the edge of a melting snowbank.

General distribution: Circumpolar, high-arctic. FIG 34, d. MAP 169.

9. **R. sulphureus** Sol.—Similar to No. 8 but coarser. The basal leaves somewhat fleshy, broadly wedge-shaped, truncate, toothed or shallowly lobed. Flowering stems stiff and stout. Flowers similar to those of the preceding but the receptacle hairy with rusty-brown hairs.

In similar places but often on open mineral soil.

General distribution: Circumpolar, high-arctic. FIG. 35,c,d. MAP 170.

10. **R. pedatifidus** Sm. var. **leiocarpus** (Trautv.) Fern.; *R. affinis* R. Br.—Tufted, essentially glabrous perennial from a short, erect, fibrous caudex bearing from a few to several erect, slender, simple or slightly forking flowering stems, 10 to 30 cm. high. Basal leaves long-petioled, cordate to reniform in outline, pedately cleft nearly to the centre into 5 to 9 entire, linear or lobed segments. Cauline leaves sessile or short-petioled, the lowermost similar to the basal leaves, the upper merely 3-cleft into linear segments. Sepals thinly grey villous on the back; petals obovate or almost orbicular, from pale to bright yellow, 0.5 to 1 cm. long; fruiting heads ovoid or short-cylindrical; achenes plump, glabrous, about 2.0 mm. long with a curved, subulate, readily deciduous beak.

Calcareous gravelly, sandy or grassy places.

General distribution: Circumpolar, arctic-alpine. FIG. 34,a. MAP 171.

11. **R. pygmaeus** Wahlenb.; DWARF BUTTERCUP—Tufted glabrous dwarf species from a simple or branched caudex bearing from a few to many slender, weak, ascending or spreading one-flowered stems 1 to 15 cm. high; basal leaves numerous, slender-petioled, the blade flabelliform to reniform, deeply palmately cleft into 3 to 5 oblanceolate-cuneate lobes. Cauline leaves 1 to 2, or wanting. Flowers 5 to 8 mm. in diameter; petals pale yellow, readily deciduous. Fruiting head globular to sub-cylindrical, 3 to 5 mm. long. Moist, grassy, and turfy places, often on snowbeds by the edge of melting snowbanks.

General distribution: Circumpolar, arctic-alpine. FIG. 35,h. MAP 172.

12. **R. Sabinei** R. Br.—Tufted, glabrous dwarf species from a simple non-fibrous caudex, bearing from one to a few rather stout, stiffly erect, 1- to 2-leaved flowering stems 3 to 10 cm. high. Basal leaves somewhat fleshy, petioled, flabellate-reniform in outline, shallowly 3- to 5-lobed; cauline leaves more deeply 3-cleft. Flowers solitary, 8 to 10 mm. in diameter; sepals purplish tinged, grey villous on the back, about as long as the oblanceolate, pale yellow petals. Fruiting heads globular to short cylindrical; the achenes 1.5 mm. long, exclusive of the slender, straight, or somewhat curved beak.

Moist, gravelly or turfy places.

General distribution: Endemic of high-arctic N. America. FIG. 35,e,f. MAP 173.

13. **R. Allenii** Robins.—Similar to No. 12 but flowering stems more slender and somewhat flexuous, simple or forking, 1- to 4-flowered, the basal leaves suborbicular-reniform and deeply 7- to 11-crenate.

Wet gravel and flood-plains of alpine brooks.

General distribution: Endemic of subarctic eastern N. America. FIG. 35,g. MAP 174.

THALICTRUM L. Meadow-Rue

T. alpinum L.; Alpine M.—Tufted dwarf perennial with bipinnate chiefly basal leaves, dark green and glossy above. Stems capillary, scapose, 8 to 10 cm. high, terminating in a simple, loose-flowered raceme of small, apetalous flowers.

Herbmats on warm, south-facing slopes. Alaska through Yukon to northern British Columbia, then isolated in the southern Cordillera, the Gulf of St. Lawrence, northern Labrador, southern E. and W. Greenland; Eurasia.

15. PAPAVERACEAE Poppy Family

PAPAVER L. Poppy

Capsule short and broad; stigmatic disc flat, narrow	1. *P. radicatum* s.lat.
Capsule twice as long as broad; stigmatic disk conical	2. *P. Keelei*

1. **P. radicatum** Rottb.; ARCTIC POPPY—Perennial scapose herb with pale yellow or white milky juice. Leaves pinnately dissected and coarsely hirsute, with dilated sheathing bases, forming rosettes at the end of the short, branching caudex. The flowers that are borne on slender, somewhat arched ascending, densely hirsute scapes are large and showy, from 2 to 4 cm. in diameter, and nodding in bud. Sepals 2, boat-shaped, densely brownish-black hirsute, caducous, petals 4, obovate, sulphur yellow or white. Capsule obovoid to turbinate, covered by stiff bristly hairs. Seeds small and numerous.

The arctic poppy is represented within our area by at least three rather well-marked and possibly specifically distinct races. One is widely distributed from E. Greenland westward at least to Banks Island and the Mackenzie Delta, north across the Arctic Archipelago beyond lat. 80°, and perhaps it is the only race found in the eastern part of this area. It has large flowers and spreading pubescence on the scapes. The second is a western or Beringian race and barely enters the westernmost part of our area. Its flowers are smaller, and the pubescence of the scapes is stiff and appressed. It is further distinguished by its rather prominent, persistent, densely packed leaf-bases. In both races white-flowered forms occur, although less commonly in the eastern race, whereas in the Western Archipelago white-flowered poppies are as common as yellow-flowered ones. The third and least known "race" has been collected thus far only a few times in the northernmost islands of the Archipelago. It forms low, few-flowered tufts, with short-petiolate, sparingly hirsute to glabrate, glaucous-green, not deeply incised leaves. The flowers are 3 to 4 cm. in diameter with petals that in life are salmon pink but in drying fade to yellow.

General distribution: *P. radicatum* s.lat. Endemic of arctic N. America. FIG. 36,e. MAP 175.

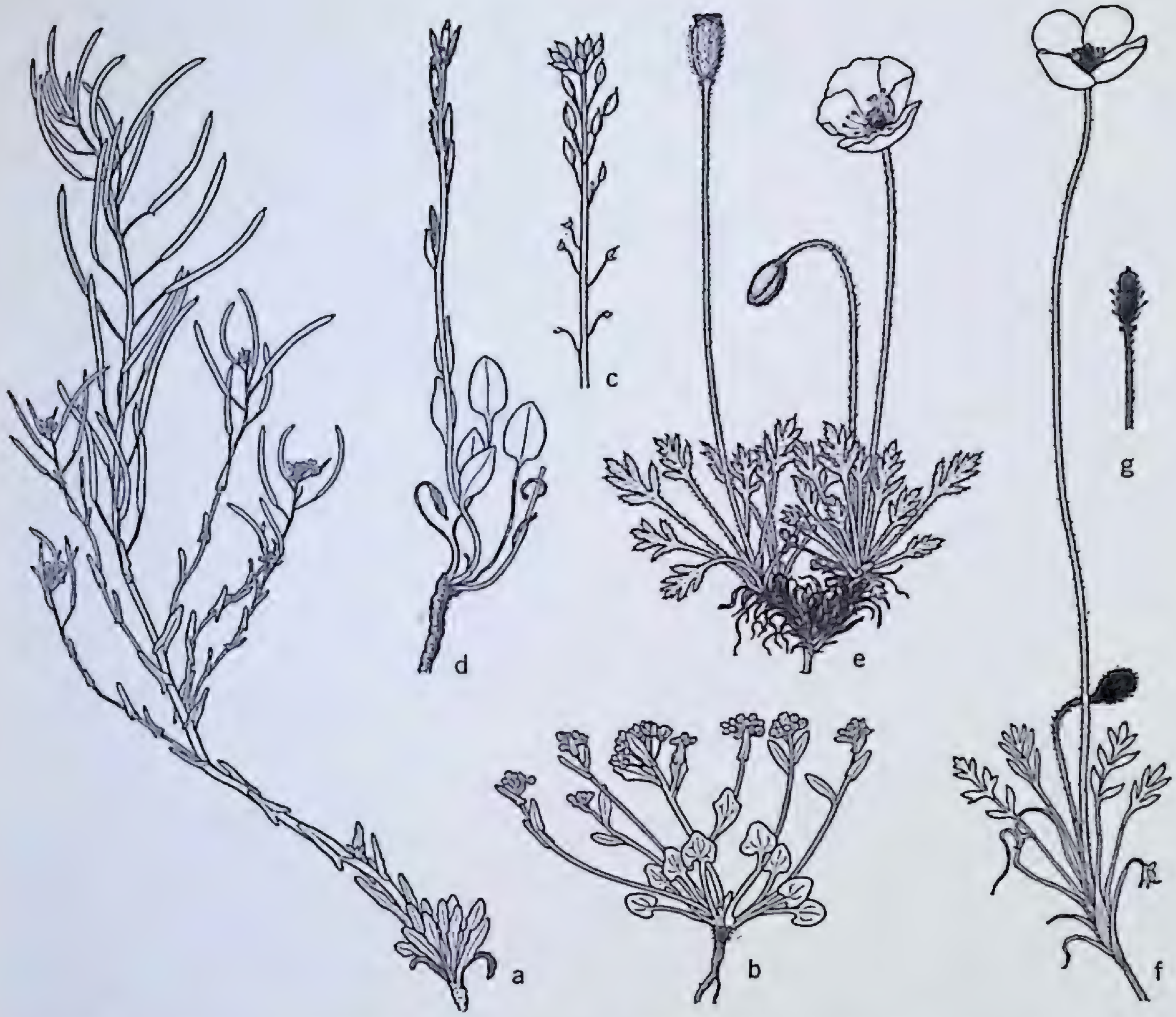

FIGURE 36. a. *Halimolobus mollis.* b. *Cochlearia officinalis* ssp. *groenlandica.* c. *C. officinalis* ssp. *arctica.* d. *Eutrema Edwardsii.* e. *Papaver radicatum.* f, g. *P. Keelei.* (2/5)

2. **P. Keelei** Porsild—Similar, but a more slender plant, with short, dark green, 5 to 8 cm. long, spreading leaves with short dark brown petioles about as long as the blade. Scapes very slender, 10 to 30 cm. long, mostly solitary or rarely two together, appressed pubescent; the flowers 2 to 3 cm. in diameter, sulphur yellow; the capsule narrowly obovoid, acute.

In rather wet places in alpine tundra.

General distribution: Endemic of arctic N.W. America. FIG. 36,f,g. MAP 176.

16. CRUCIFERAE Mustard Family

Herbs with acrid, watery juice and regular cruciform flowers with 4 deciduous sepals, 4 petals, and 6 stamens. Fruit a 2-valved pod or silique, 2-locular by a thin membranaceous partition or septum stretched between the marginal placentae. The leaves are alternate in ours and lack stipules. Flowers in terminal racemes or corymbs.

a. Siliques short, at most three times as long as broad
b. Siliques distinctly flattened 6. Draba
b. Siliques globose to ovoid, scarcely if at all flattened
c. Flowers white (or sometimes lilac or pink in *Braya*)
d. Siliques glabrous 1. Cochlearia
d. Siliques hirsute 10. Braya
c Flowers yellow 5. Lesquerella
a. Siliques long, three to more times as long as broad
e. Siliques distinctly flattened
f. Siliques less than 15 mm. long 6. Draba
f. Siliques longer
g. Valves of ripe siliques elastic coiling or rolling into rings upon falling, seeds wingless 4. Cardamine
g. Valves not elastic, seeds mostly winged 7. Arabis
e. Siliques terete or quadrangular in cross-section
h. Siliques torulose
j. Siliques narrow, 2 mm. wide or less 10. Braya
j. Siliques 3–6 mm. wide 11. Parrya
h. Siliques not torulose
k. Leaves bi-pinnatifid 3. Descurainia
k. Leaves entire or at most coarsely repand dentate
l. Siliques 1.5 cm. long or less, septum perforated 2. Eutrema
l. Siliques 2–11 cm. long, more or less curved, septum entire
m. Flowers purple, large 9. Erysimum
m. Flowers small, white 8. Halimolobos

1. Cochlearia L. Scurvy-Grass

C. officinalis L.—Glabrous somewhat fleshy halophytic biennial which the first year forms a rosette of reniform, ovate to rounded-deltoid entire or shallowly dentate slender-petiolate leaves. The small white flowers appear early the second season and are first hidden among the leaves, but the raceme soon elongates, and the fruiting stems become arched or even decumbent, with a few scattered, repand-dentate oblong leaves. The glabrous ellipsoid-oblong siliques are 5 to 8 mm. long and are borne on slender erect-spreading peduncles.

Two weakly differentiated and perhaps overlapping races or varieties of the polymorphic *C. officinalis* occur in our area. One, with single or freely branched, mostly erect stems [ssp. *arctica* (Schlecht.) Hult.] appears to be predominantly western, whereas a lower and often prostrate or depressed-stemmed race [ssp. *groenlandica* (L.) n. comb.] perhaps is restricted to the Eastern Arctic.

The scurvy-grass is common in not too dry places near the beach. It is strongly nitrophilous and for this reason is much favoured by the manure of nesting sea-birds. The succulent leaves are edible, either fresh or cooked, and are reputed to be rich in ascorbic acid.

General distribution: *C. officinalis* s. lat. Circumpolar. Fig. 36,b,c. Map 177.

2. Eutrema R. Br.

E. Edwardsii R. Br.—Glabrous and slightly fleshy perennial with a slender tap-root and from 1 to 20 simple, erect, few-leaved stems 10 to 30 cm. high. Basal leaves slender and long-petioled with entire lanceolate-ovate blades 1.5 to 2.5 cm. long; the 3 to 6 cauline leaves sessile. Inflorescence terminal, at first capitate but soon elongating into a 7- to 20-flowered,

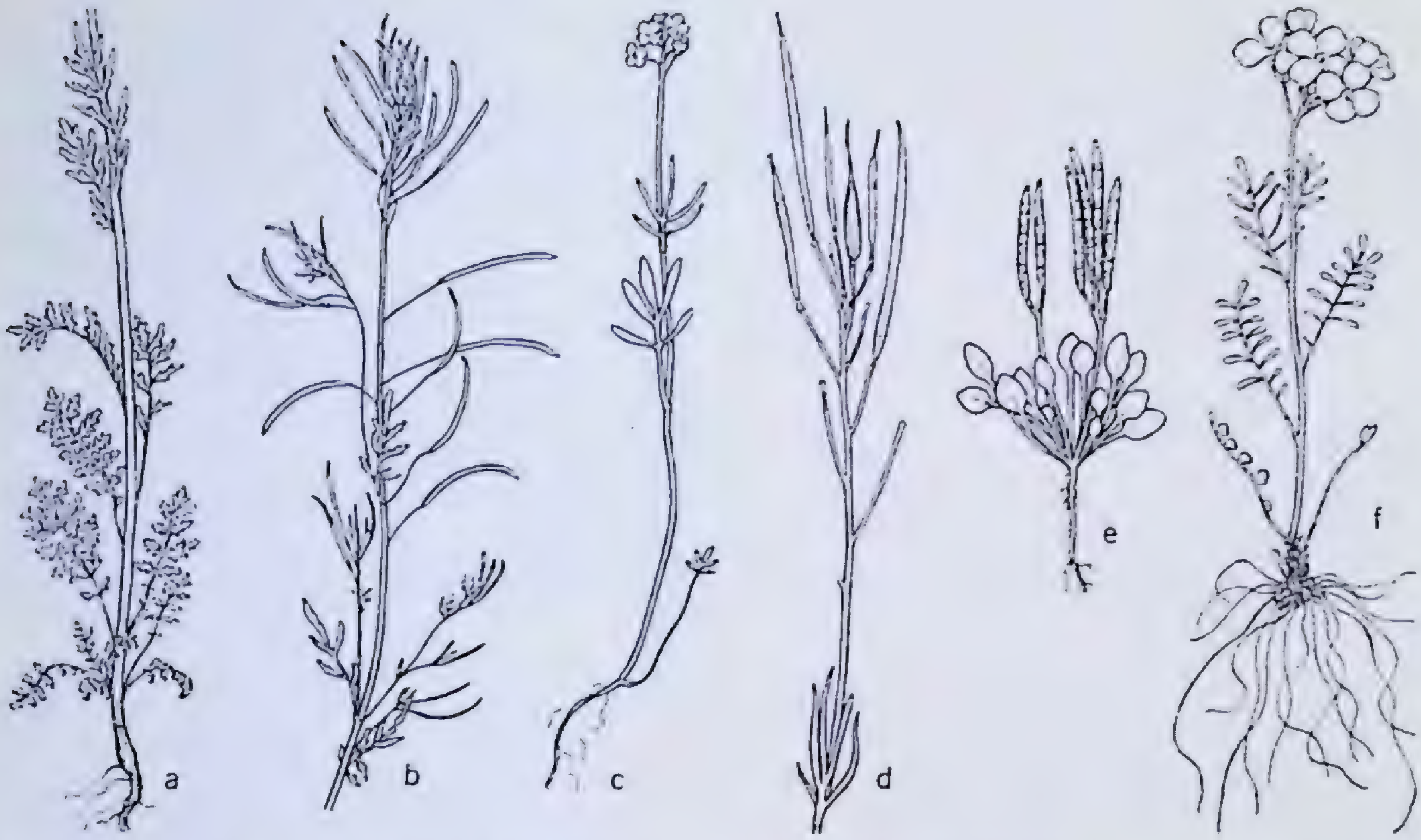

FIGURE 37. a, b. *Descurainia sophioides.* c, d. *Cardamine digitata.* e. *C. bellidifolia.* f. *C. pratensis* var. *angustifolia.* (1/2)

5 to 10 cm. long raceme. Flowers small, the petals white, twice as long as the greenish-purple sepals. Mature siliques dark purple, linear-lanceolate, 10 to 15 mm. long, erect or ascending on slender pedicels of approximately the same length. The valves prominently keeled and the septum always perforated.

In not too dry, turfy places in tundra; the species is strongly nitrophilous and mostly restricted to calcareous soils.

General distribution: Circumpolar, arctic or high-arctic. FIG. 36,d. MAP 178.

3. DESCURAINIA Webb & Berth. Tansy-Mustard

D. sophioides (Fisch.) Schulz—Puberulent or slightly glandular biennial of weedy habit with simple or branching, sparsely-leaved stems 15 to 100 cm. high, from a basal rosette of mostly bipinnatifid leaves, which remain green throughout the first winter and usually wither at the time of flowering. Terminal racemes usually much elongated toward maturity. Flowers small and pale yellow. Siliques from 10 to 30 mm. long and about 1 mm. wide, somewhat curved, on short, very slender, spreading pedicels 5 to 7 mm. long.

An indigenous but weedy species, no doubt often spread by man and frequently growing on refuse heaps near human habitations. Not uncommon, however, on damp soil especially in places where landslips or soil movement has occurred.

General distribution: Asia and arctic western N. America. FIG. 37,a,b. MAP 179.

4. CARDAMINE L. Bitter Cress

Ours glabrous perennial herbs with entire or pinnate leaves, small white flowers and linear, flattened siliques with nerveless or finely nerved valves opening elastically from the base.

Dwarf species with ovate, entire leaves	1. *C. bellidifolia*
Taller, with pinnate leaves	
Leaflets numerous, linear or ovate, 5–8 mm. long	2. *C. pratensis*
Leaflets 5–7, linear-lanceolate, 10–25 mm. long	3. *C. digitata*

1. **C. bellidifolia** L.—Low and tufted with oval, entire, slender petioled leaves and erect-ascending mostly from 2 to 10 cm. high flowering stems. Inflorescence 2- to 5-flowered, first capitate but soon elongating. Petals milky white, twice as long as the purple sepals. Siliques linear, short-peduncled, 15 to 25 mm. long and 1 to 1.5 mm. wide, stiffly erect with a short, thick style.

Wet mossy places, often by cold brooks and in shaded rock crevices.

General distribution: Circumpolar, arctic-alpine. FIG. 37,e. MAP 180.

2. **C. pratensis** L. var. **angustifolia** Hook.—Stems simple and ascending from a short rootstock. Leaflets numerous and small. Flowers large with white or lavender petals thrice the length of the sepals. A variable species, which in our area reproduces vegetatively by leaf buds. Occasional to common in wet calcareous meadows and flood plains.

General distribution: From Alaska across arctic and boreal parts of the continent to E. and W. Greenland. FIG. 37,f. MAP 181.

3. **C. digitata** Richards.—Stems simple and ascending 5 to 20 cm. high from a slender and fragile creeping rootstock, which is deeply buried in the soil. Basal leaves slender-petioled composed of from 5 to 7 linear-lanceolate, somewhat crowded, spreading leaflets 10 to 25 mm. long and 2 to 5 mm. wide. Inflorescence of from 10 to 20 flowers, at first subcapitate, soon elongating. Flowers about 6 mm. high, the petals milky white, twice as long as the sepals. Mature siliques from 20 to 40 mm. long and 2 mm. wide, gradually tapering into a slender, 2 to 3 mm. long beak.

Moist, turfy places, often growing on the sides or between large "niggerheads" in tundra. The species is strongly nitrophilous responding to animal manure by luxuriant development of the vegetative parts.

General distribution: Endemic of western N. American Arctic. FIG. 37c, d. MAP 182.

5. LESQUERELLA S. Wats.

L. arctica (Wormskj.) Wats.—Silvery-stellate pubescent caespitose perennial with a stout tap-root and simple or branched caudex. Basal leaves with a spatulate or oblanceolate blade tapering into a short petiole. Flowering stems decumbent, ascending or erect, 5 to 20 cm. long, with a few reduced leaves. Flowers 2 to 8, pale yellow, on long, rather stout pedicels; siliques globular or slightly pear-shaped, about 4 mm. in diameter, glabrous (or covered with small scurfy scales, in the Cordilleran, ssp. *Purshii)* on ascending pedicels 1 to 2 cm. long.

Calcareous cliffs and stony barrens.

General distribution: N. American arctic; Asia. FIG. 40,c. MAP 183.

6. DRABA L.

Low, caespitose or tufted perennial (ours) and mostly pubescent herbs with entire or toothed leaves, white or yellow flowers and flat elliptic, ovate or linear siliques from one to three times as long as broad.

- a. Flowers yellow
  - b. Siliques glabrous
    - c. Leaves essentially glabrous — 1. *D. crassifolia*
    - c. Leaves pubescent with simple or variously forked but not stellate hairs
      - d. Siliques ovate-lanceolate; styles long — 2. *D. alpina*
      - d. Siliques elliptic; styles very short — 8. *D. oblongata*
  - b. Siliques hairy — 3. *D. Bellii*
- a. Flowers white
  - d. Plants scapose, or at most with a single cauline leaf near the base of the scape
    - e. Siliques glabrous
      - f. Basal leaves glabrous or at most with a few simple marginal hairs — 4. *D. Allenii*
      - f. Basal leaves hairy
        - g. Pubescence of leaves close pannose-stellate — 5. *D. nivalis*
        - g. Pubescence of leaves of simple or variously forked hairs; midrib prominent
          - h. Inflorescence capitate, much elongated in fruit; siliques lanceolate — 6. *D. lactea*
          - h. Inflorescence capitate, not elongating in fruit; siliques oval-orbicular — 7. *D. subcapitata*
    - e. Siliques hairy
      - i. Pubescence of siliques of simple hairs
        - j. Basal leaves entire — 8. *D. oblongata*
        - j. Basal leaves usually with a few coarse teeth near the apex — 9. *D. norvegica*
      - i. Pubescence of siliques close-stellate — 12. *D. groenlandica*
  - d. Plant not scapose; stems with 2–several cauline leaves
    - l. Siliques glabrous — 10. *D. glabella*
    - l. Siliques hairy
      - m. Basal leaves stellate-pannose — 11. *D. cinerea*
      - m. Basal leaves hispid with mixed simple and variously forked hairs — 9. *D. norvegica*

1. **D. crassifolia** Grah.—Dwarf species from a weak tap-root, with tufted, lanceolate, entire, glabrous, or at most ciliate basal leaves. Flowering stems ascending or arching, 2 to 10 cm. high, glabrous, and usually without leaves. Inflorescence with few and pale yellow flowers and glabrous, lanceolate siliques.

Rare in herbmats and on snowbeds.

General distribution: N. America, subarctic-alpine. N.W. Europe but not E. Siberia. FIG. 38,e. MAP 184.

2. **D. alpina** L.—Densely tufted scapose plants with lanceolate, somewhat fleshy leaves with a prominent midrib and long, rather stiff hairs along the margins; the upper and under surface glabrous or sparingly beset with simple or variously branched but not stellate hairs. The stiffly erect scapes from a few to 15 cm. high and sparsely covered by simple or forked, soft, spreading hairs; the inflorescence short and corymbose with from 3 to

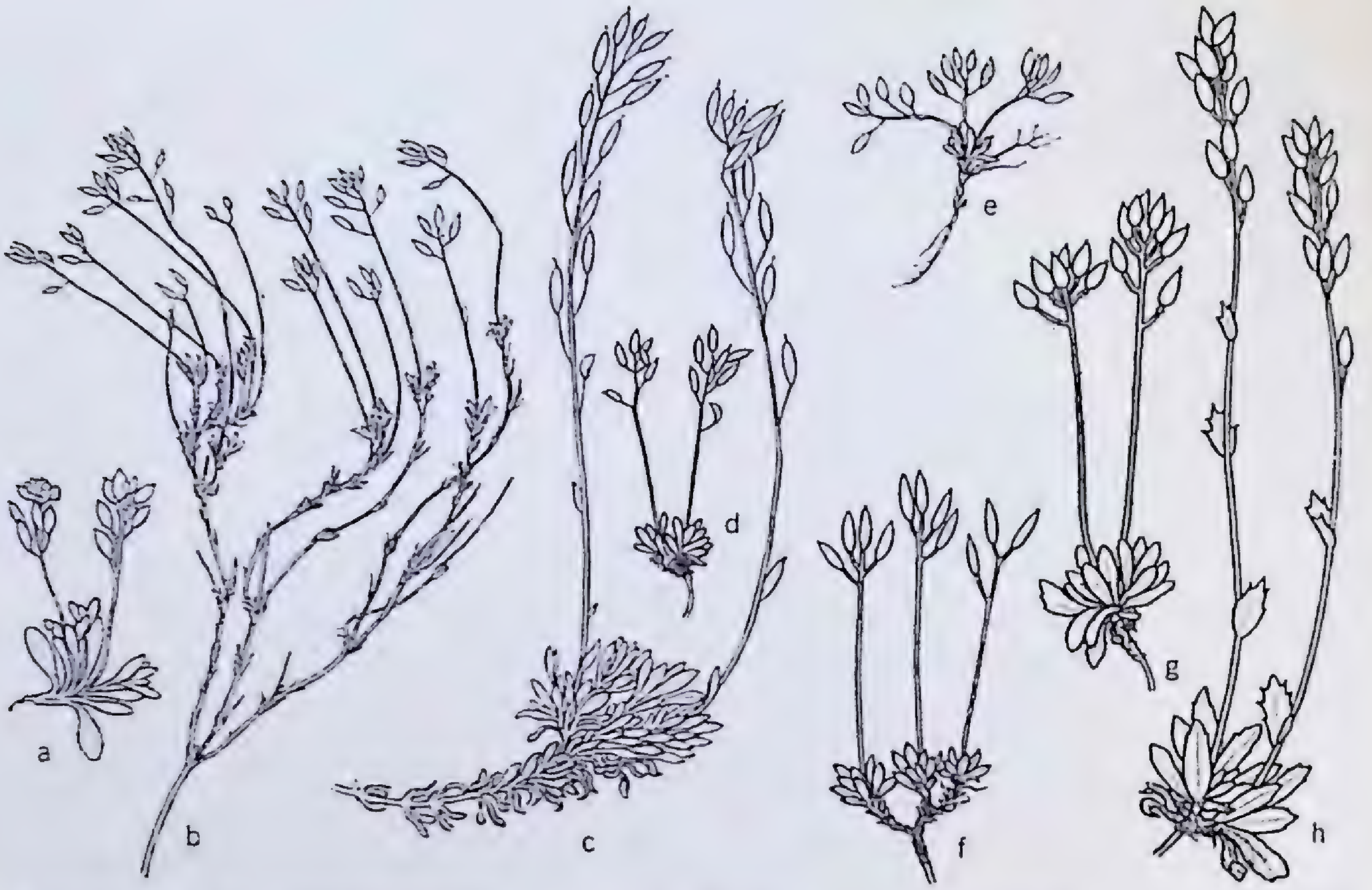

FIGURE 38. a. *Draba norvegica.* b. *D. Allenii.* c. *D. cinerea.* d. *D. nivalis.* e. *D. crassifolia.* f. *D. lactea.* g. *D. alpina.* h. *D. glabella.* (1/2)

10 rather large flowers. Petals yellow, about twice as long as the hairy sepals. Siliques glabrous, broadest below the middle, about 10 mm. long or as long as their spreading pedicels, with prominent styles 1 mm. long.

Common on snowbeds, in moist tundra, or in clay on wet gravelly barrens.

General distribution: Circumpolar, high-arctic, alpine. FIG. 38,g. MAP 185.

3. **D. Bellii** Holm.—Similar, but more densely caespitose, forming rather compact, firm hemispherical tussocks of tightly packed caudices from a many-headed tap-root. The marcescent densely crowded rosette leaves, conspicuously villous from simple as well as variously forked hairs. Flowers pale yellow or creamy white; the conspicuously pubescent siliques elliptic-oblong, rarely twice as long as broad. In the western and northern islands represented by the var. *gracilis* Ekm. distinguished by narrower and lanceolate siliques.

Common in dry, calcareous barrens and in rocky places.

General distribution: Endemic of the Arctic Archipelago. FIG. 39,a,b. MAP 186.

D. aurea M. Vahl—Tufted perennial from a branched, leafy caudex; basal leaves oblanceolate, densely stellate pubescent; stems 10 to 30 cm. high, leafy; petals yellow; the hairy siliques 10 to 15 mm. long, often twisted in age, erect on 5 mm. long pedicels; styles long.

Dry, calcareous slopes. Alaska, Yukon southward in the Rocky Mts.; Lake Superior, James B., northern Labrador, southern E. and W. Greenland.

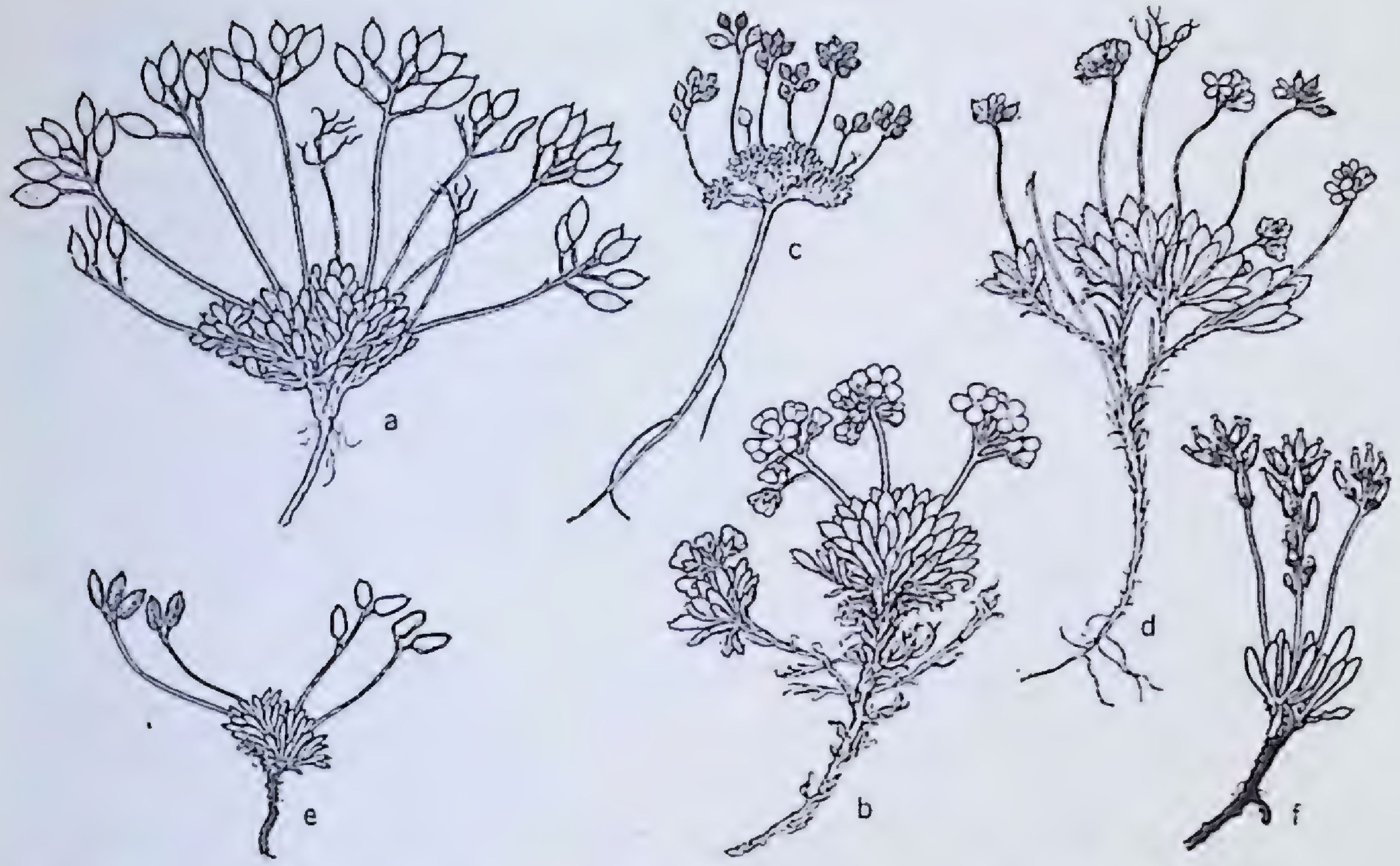

FIGURE 39. a, b. *Draba Bellii*. c. *D. subcapitata*. d. *D. oblongata*. e. *Braya Thorild-Wulffii*. f. *B. purpurascens*. (1/2)

4. **D. Allenii** Fern.—Loosely matted, the freely branched caudices covered by the pale marcescent midribs of former leaves. Basal leaves narrowly lanceolate, glabrous, or at most sparingly ciliate toward the tip, with a prominent midrib. Scapes slender, glabrous, 3 to 8 cm. high. Inflorescence 2- to 8-flowered, elongated in fruit. Petals white.

Calcareous cliffs and screes.

General distribution: Endemic of subarctic eastern N. America. FIG. 38,b. MAP 187.

5. **D. nivalis** Liljebl.—Low and caespitose, forming small, loose mats that may be recognized even from a distance by their characteristic pale glaucous colour due to the dense stellate pubescence of the crowded narrowly oblong or ligulate leaves. Flowering stems scapose, or at most with a single cauline leaf near its base, 5 to 10 cm. high, sparsely stellate pubescent. Flowers small, white; the inflorescence much elongated in fruit. Siliques linear-elliptic, lanceolate, glabrous, somewhat shiny, usually 6 to 8 mm. long, or as long as their pedicels. Style long.

Common in dry, rocky, or gravelly situations.

General distribution: Circumpolar, arctic-alpine. FIG. 38,d. MAP 188.

6. **D. lactea** Adams; *D. fladnizensis* Wulfén var. *heterotricha* (Lindbl.) Ball—Dwarf species forming small loose mats; leaves linear-oblong, ciliate with long simple hairs, and keeled by the short but prominent midrib that is particularly noticeable in the old, marcescent leaves that persist for

several years. Scapes 5 to 10 cm. high, glabrous; inflorescence short-racemose, usually from 3- to 7-flowered, much elongated in fruit; petals white; siliques ovate-lanceolate, 6 to 8 mm. long and 3 to 4 mm. wide, dark green and glabrous, slightly longer than their spreading pedicels.

Common in not too dry turfy places in tundra and on snowbeds.

General distribution: Circumpolar, high-arctic. FIG. 38,f. MAP 189.

7. **D. subcapitata** Simm.—Low, scapose plant forming small, hemispherical mats. The marcescent basal leaves linear-oblong or spatulate, ciliated with long, simple hairs, with a prominent midrib. Scapes usually 3 to 5 cm. high, softly pubescent with variously forked hairs. Inflorescence few-flowered, capitate, scarcely if at all elongating in fruit. Siliques 4 to 5 mm. long and 2 to 3 mm. wide, elliptic-lanceolate, glabrous, dark green or purplish, sub-sessile or on pedicels shorter or at most equalling the length of the spreading siliques. Styles short.

A pronounced calcicole not uncommon in dry tundra or in gravelly places.

General distribution: Amphi-Atlantic, high-arctic. FIG. 39,c. MAP 190.

8. **D. oblongata** R. Br.; *D. micropetala* Hook.—Loosely tufted from a weak, branched base, resembling *D. alpina*, from which it may be distinguished by its somewhat denser soft pubescence consisting of mostly branched hairs and by its densely capitate, non-elongating inflorescence of smaller flowers. Scapes 3 to 8 cm. high, soft pubescent. The petals are pale yellow or creamy white, not much longer than the mostly purple-tinged sepals; the siliques are short-pubescent, elliptic, with very short styles.

Rare or local in moist tundra.

General distribution: A little known species which is probably endemic to high-arctic N. America. FIG. 39,d. MAP 191.

9. **D. norvegica** Gunn.; *D. rupestris* R. Br.—Loosely caespitose dwarf species. Basal leaves oblanceolate, entire or often with a few coarse teeth near the apex, hispid-pilose from simple and forked hairs. Stems 5 to 10 cm. high, with a single cauline leaf near its base, in tall specimens occasionally forked below. Flowers large and white, the inflorescence soon elongating. Siliques elliptic, 5 to 8 mm. long, sparingly hispid along the margins, the valves mostly hirtellous; style short and thick.

Stony and gravelly, not too dry places.

General distribution: Amphi-Atlantic, subarctic. FIG. 38,a. MAP 192.

10. **D. glabella** Pursh—Coarse tufted or loosely matted perennial with 1 to 5 cm. long entire or few-toothed, cuneate, oblanceolate, or spatulate fresh green basal leaves sparingly to densely covered by soft, stellate, forked and simple hairs. Flowering stems simple or forking, 10 to 25 cm. high, soft stellate pubescent or glabrate above, bearing from 1 to 7 cauline leaves. Inflorescence first capitate soon elongating to a lax 5- to 15-flowered raceme. Petals white. Siliques glabrous, narrowly lanceolate, 6 to 15 mm. long and usually as long as their pedicels, with a very short style.

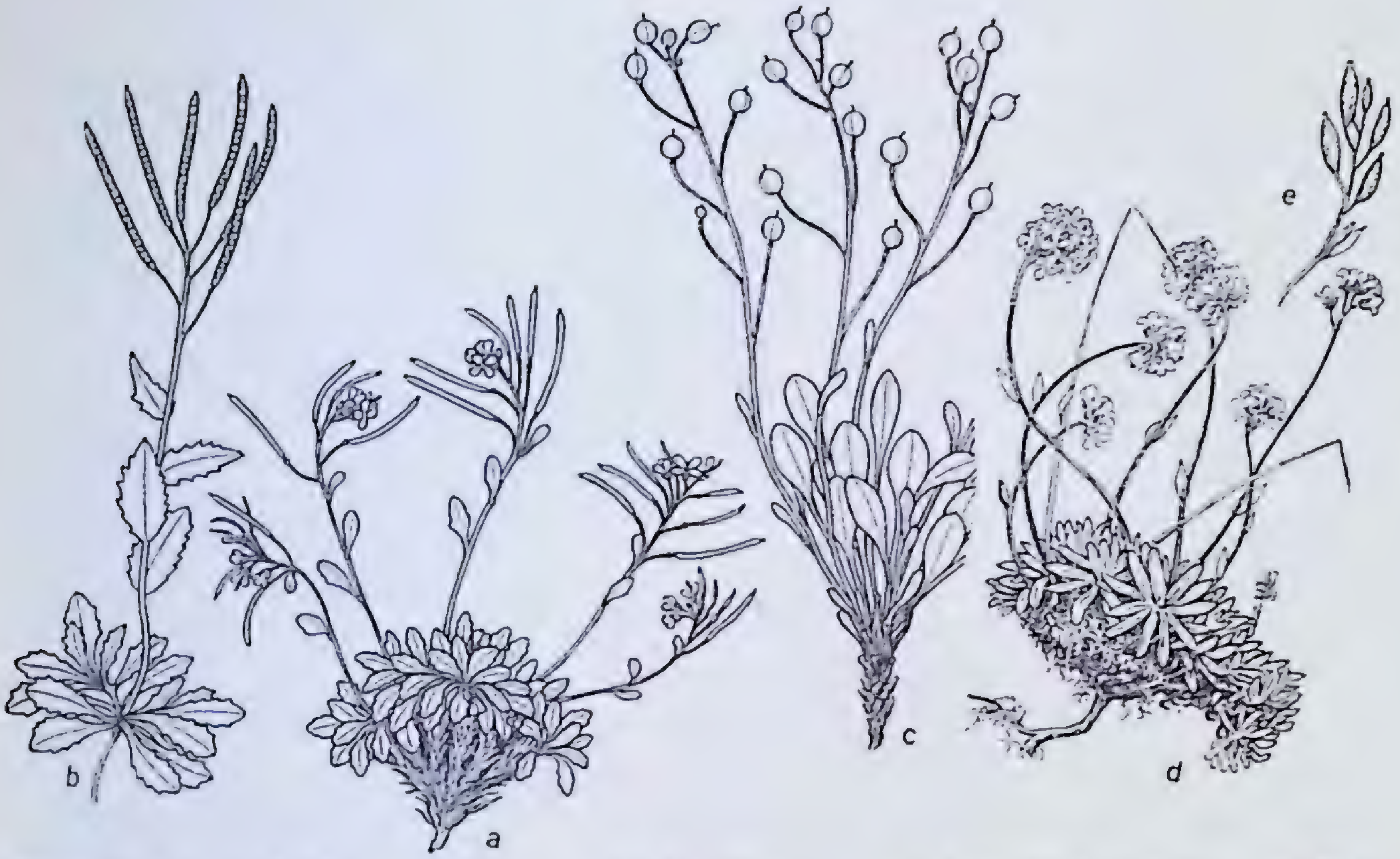

Figure 40. a. *Arabis arenicola.* b. *A. alpina.* c. *Lesquerella arctica.* (2/5)
d, e. *Draba groenlandica* (1/2)

Common in not too dry rocky or grassy situations; strongly nitrophilous, favouring animal dung.

General distribution: Circumpolar, wide-ranging, arctic-alpine. Fig. 38,h. Map 193.

11. **D. cinera** Adams—Densely caespitose with 0.5 to 1.5 cm. long, entire, cuneate, oblanceolate or spatulate leaves which are ashy grey from a dense, felt-like covering of stellate hairs, mixed along the margins with long simple hairs. Flowering stems simple or forked, 10 to 25 cm. high, stiffly erect or ascending, stellate pubescent throughout and bearing 1 to 3 leaves. Inflorescence, 5- to 16-flowered, soon elongating into a lax raceme. Petals white. Siliques greenish-grey from dense stellate pubescence, narrowly lanceolate, usually 7 to 10 mm. long and slightly shorter than their pedicels. Styles long.

Calcareous rocky barrens and sunny cliffs.

General distribution: Circumpolar (?), low-arctic, alpine. Fig. 38,c. Map 194.

12. **D. groenlandica** El. Ekman—Resembling *D. cinerea* but flowering stems simple and rarely more than 10 cm. tall with a single cauline leaf. Basal leaves entire, hispid-pilose, with a mixture of simple and variously forked hairs. Siliques short stellate-pubescent; style short and thick.

Barren, gravelly places.

General distribution: Endemic of the Arctic Archipelago. Fig. 40,d,e. Map 195.

7. ARABIS L. Rock-cress

Ours perennial with sub-entire or toothed leaves and leafy, erect-ascending or decumbent flowering stems. Flowers white or pale pink, siliques linear, flat, 6 to 20 times as long as broad.

Coarse and matted; basal leaves sessile	1. A. *alpina*
Caespitose; basal leaves petioled	2. A. *arenicola*

1. A. **alpina** L.—Coarse, fetid and matted, with a slender and freely branched leafy caudex. Leaves all similar, 2 to 5 cm. long and 1 to 2 cm. wide, oblanceolate to obovate, sessile, the upper somewhat clasping, fresh green and somewhat fleshy, coarsely dentate or sub-entire, usually densely stellate pubescent on both sides. Flowering stems erect-ascending, leafy, simple or branched, terminating in a large raceme. Petals white, 7 to 9 mm. long and 2 to 4 mm. broad. Siliques glabrous, 4 to 5 cm. long and 1.5 to 2.5 mm. broad, ascending and often somewhat curved, on pedicels one-third to one-half as long as the siliques.

Moist grassy and springy places.

General distribution: Amphi-Atlantic, subarctic. FIG. 40,b. MAP 196.

2. A. **arenicola** (Richards.) Gel.—Caespitose, essentially glabrous perennial with a much-branched caudex. Basal leaves 2 to 4 cm. long, on slender petioles, the blade oblanceolate-cuneate, repand or sparsely toothed, dark green, and somewhat fleshy. Flowering stems somewhat flexuous, ascending or decumbent, bearing 3 to 4 sessile leaves, terminating in a rapidly elongating 5- to 20-flowered raceme. Petals narrowly oblanceolate, 5 mm. long, white or pale pink. Siliques glabrous, greenish-purple, 2 to 2.5 cm. long and 2 mm. wide, on pedicels half as long as the siliques.

Calcareous sand and gravel, often by lake shores or river-banks.

General distribution: Endemic of the Eastern N. American Arctic. FIG. 40,a. MAP 197.

A. **Holboellii** Hornem.—Stems erect, one to several, 30 to 60 cm. high from leafy, soon wilting rosettes. Cauline leaves linear, sagittate at the base. Petals purple, pink or white; mature siliques pendulous, 3 to 8 cm. long.

Sunny, calcareous south slopes. Eastern N. American Arctic.

8. HALIMOLOBOS Tausch

Halimolobos mollis (Hook.) Rollins; *Arabis Hookeri* Lange—Coarse biennial of weedy habit, usually with several erect-ascending, 10 to 50 cm. high, simple or branched stems from a simple caudex. Stems hirsute below, glabrous or with a few simple hairs above. Basal leaves 3 to 6 cm. long, oblanceolate, sinuate-dentate, densely hirsute with forked hairs; cauline leaves 1 to 3 cm. long, sessile, auricled or sagittate with dentate to entire margins. Inflorescence at first capitate, soon elongating. Flowers small, white. Siliques 3 to 5 cm. long and about 2 mm. wide, glabrous and with strongly nerved valves.

A dung-loving calciphilous species of peculiar, disrupted range and undoubtedly often dispersed by man and animals; the seeds become sticky when wet.

General distribution: Endemic of arctic N. America. FIG. 36,a. MAP 198.

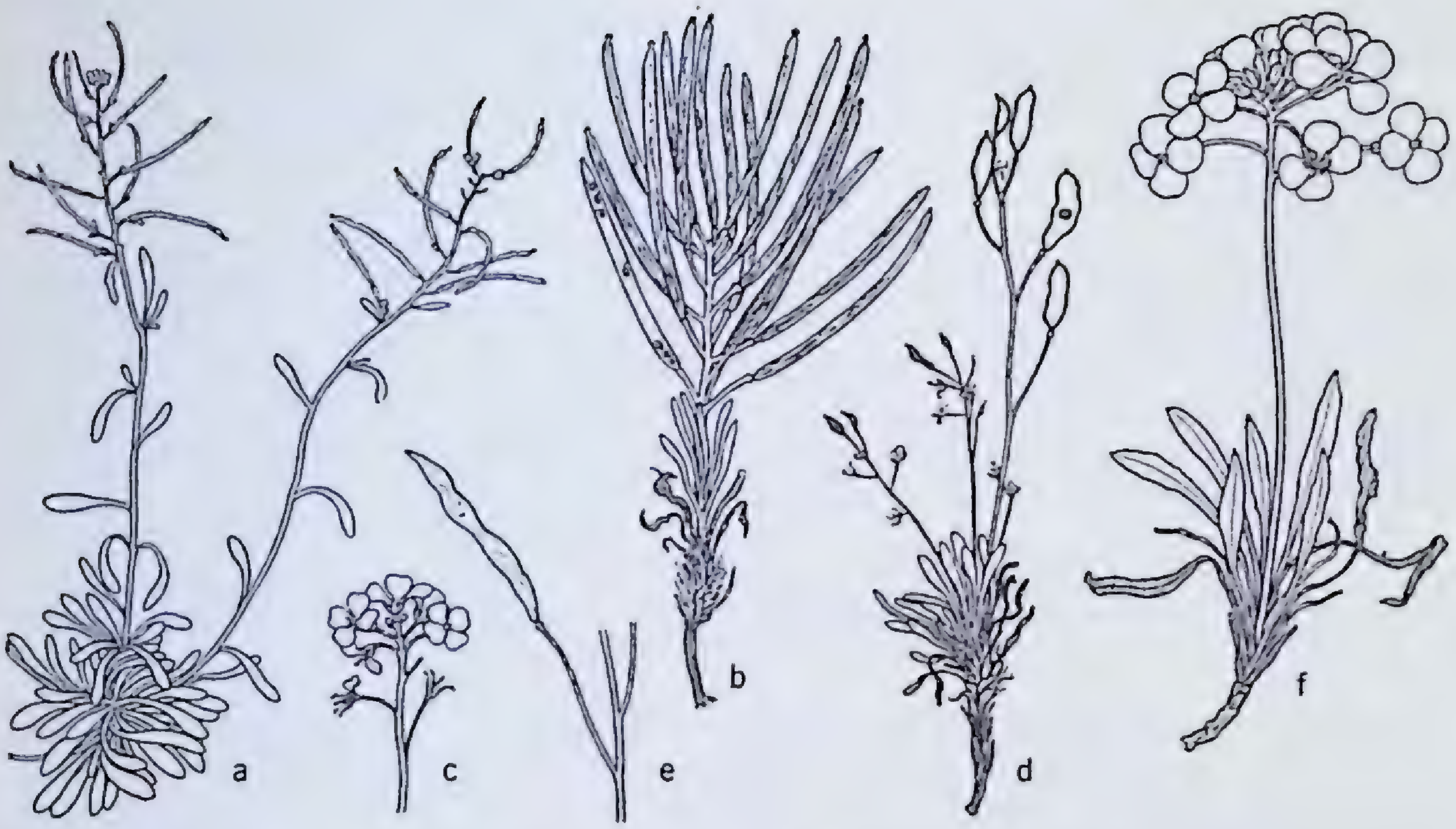

FIGURE 41. a. *Braya humilis* ssp. *arctica.* b. *Erysimum Pallasii.* c, d. *Parrya arctica.* e, f. *P. nudicaulis.* (2/5)

9. ERYSIMUM L. Wallflower

E. Pallasii (Pursh) Fern.—Biennial or short-lived perennial which, after two to several years in the rosette stage, flowers, matures, and dies. Entire plant, except the petals and stamens, sparsely clothed by peculiar appressed, 2-parted white hairs, attached in the middle by a very short stalk, and oriented parallel to the axis of the organ on which they are placed. Basal leaves linear-lanceolate, 5 to 7 cm. long, the entire or repand-dentate blade 3 to 4 mm. wide, gradually tapering into a narrow petiole. Inflorescence, racemose, 50- or more-flowered; when the first flowers expand, the flowering axis is so short that the flowers appear as if developed at the base of the leaves, among which they are hidden. The axis soon elongates, becoming 15 to 35 cm. long. In plants coming into flower late in the season, this elongation does not take place, and the siliques, therefore, form among the withering leaves. This pseudo-acaulescent form looks very odd but apparently is of no taxonomic significance (f. *humilum*).

The large, purple flowers are very fragrant. Siliques linear, somewhat curved, 4 to 11 cm. long and 2 to 3 mm. wide. Seeds 2 mm. long.

A pronounced dung-loving calciphile inhabiting sunny, grassy places, often near animal burrows or human habitation or below bird cliffs.

General distribution: Circumpolar, high-arctic. FIG. 41,b. MAP 199.

10. BRAYA Sternb. & Hoppe

Low perennial, and mostly purplish-tinged herbs of tufted habit with simple, entire, or toothed leaves. Flowers white or lilac; siliques cylindric and somewhat torulose.

Flowering stems leafy, siliques linear, 1 mm. wide 1. *B. humilis* ssp. *arctica*
Flowering stems scapose, siliques plump, 2 to 3 mm. wide
  Scapes stiffly erect-ascending, siliques 3 to 5 times as long as broad 2. *B. purpurascens*
  Scapes decumbent, siliques 1.5 to 2 times as long as broad 3. *B. Thorild-Wulffii*

1. **B. humilis** (C. A. Mey.) Robins. ssp. **arctica** (Böcher) Rollins; *Torularia humilis* (C. A. Mey.) Schulz—Basal leaves oblanceolate, toothed or entire, glabrous or pubescent, with simple or forked hairs, often dark purplish tinged. Flowering stems mostly 10 to 20 cm. high, simple or forked and sparingly leafy below. Flowers white or lilac; siliques 1 to 2 cm. long, 1 mm. wide, spreading, torulose and somewhat curved, minutely pubescent. Style short and stout with distinctly bilobed stigma.

Calcareous clay and gravel barrens.

General distribution: Ssp. *arctica:* Endemic of N. E. Greenland and high-arctic parts of Canada. Fig. 41,a. Map 200.

2. **B. purpurascens** (R. Br.) Bunge—Caespitose, with a stout tap-root and freely branching caudex. Leaves mostly basal, rosulate, somewhat fleshy, linear-oblanceolate, entire, obtuse, 2 to 3 cm. long, 2 to 3 mm. wide, glabrous, and mostly purplish tinged. Stems scapose or occasionally with a single leaf supporting the lowermost flower, stiffly erect or ascending, often somewhat flexuous, glabrate or soft pubescent, dark purple, 5 to 15 or rarely 20 cm. high in fruit. Flowering raceme at first capitate, soon elongating, 5- to 25-flowered. Sepals tardily deciduous; petals white or dilute purplish. Siliques plump, 1 to 1.4 cm. long, 2 to 3 mm. wide, glabrous, glabrate or soft pubescent.

A rather variable species which may comprise several geographical races. Thus, the western arctic population of *B. purpurascens* appears to be consistently more hirsute than that of the eastern N. American Arctic, with slender and stiffly erect scapes and narrower siliques.

Calcareous clay and gravel barrens.

General distribution: Circumpolar, high-arctic. Fig. 39, f. Map 201.

3. **B. Thorild-Wulffii** Ostenf.—Low, caespitose plant with decumbent flowering and fruiting scapes. Basal leaves somewhat fleshy, oblong, entire, about 1 cm. long, crisply ciliated. Scapes densely and crisply pubescent, up to 7 cm. long. Flowering raceme at first capitate but soon elongating. Flowers small, the sepals hirsute near the tip, slightly shorter than the white or rose-pink petals. Siliques ovate and plump, 5 to 8 mm. long and 2 to 3 mm. wide, the convex valves densely pilose; stigmas bilobed, sessile.

Calcareous, gravelly barrens.

General distribution: High-arctic endemic of northernmost Greenland and the Canadian Arctic Archipelago. Fig. 39, e. Map 202.

11. Parrya R. Br.

Caespitose, essentially glabrous perennials with thick-branching caudices, entire or repand-dentate, somewhat fleshy rosulate leaves and scapose stems. Inflorescence racemose with large lavender or white flowers; siliques linear-lanceolate, keeled, 3 to 6 mm. wide, torulose and somewhat sinuate. Seeds large, with a broad wing formed by the honeycombed, loosely fitting epidermis of the seed-coat.

Flowers about 1 cm. in diameter	1. *P. arctica*
Flowers 1.5 to 3.3 cm. in diameter	2. *P. nudicaulis*

1. **P. arctica** R. Br.—Leaves 2 to 3 cm. long, narrowly oblanceolate, short-petiolate, entire or rarely obscurely toothed; scapes 5 to 10 cm. high or rarely 20 cm. in fruit; inflorescence short racemose, 7- to 12-flowered. Flowers scentless, petals purple or creamy white, about 8 mm. long; anthers short and ovate. Silique 2 to 3 cm. long and 3 to 4 mm. wide, straight, strongly keeled when fresh; seeds 2 to 3 in each locule, large, 4 × 5.5 mm., including the broad wing.

In Banks and Victoria islands the purple- and white-flowered forms are equally common and often grow side by side.

Wet calcareous clay and gravel barrens.

General distribution: Endemic of the Palæozoic parts of the central Canadian Arctic. Fig. 41, c,d. Map 203.

2. **P. nudicaulis** (L.) Regel—Leaves 5 to 10 cm. long, narrowly oblanceolate, acute, long-petioled, entire or toothed, mostly glabrous and somewhat fleshy. Scapes 10 to 20 cm. or even 30 cm. high in fruit, glabrous or glandular-hispid. Flowers large and very fragant; petals rose-purple or white, 1.0 to 1.5 cm. long, prominently clawed; anthers linear oblong 1.5 to 2.0 mm. long. Siliques 3 to 5 cm. long and 4 to 6 mm. wide, strongly sinuate, rarely straight, glabrous or hispidulous, with 2 to 3 large seeds in each locule.

Calcareous, alpine meadows.

General distribution: Arctic-alpine Eurasia and N.W. America. Fig. 41,e,f. Map 204.

17. CRASSULACEAE Stonecrop Family

In our area represented by one species of the genus *Rhodiola*.

Rhodiola L.

R. Rosea L.; *Sedum Rosea* (L.) Scop.; Roseroot—Succulent, dioecious perennial herb with a thick and much-branched, scaly rootstock bearing numerous, leafy stems 5 to 20 cm. high. Leaves pale, glaucous, and somewhat spoon-shaped, oblong-lanceolate, entire or dentate, 1 to 4 cm. long. Flowers in a dense terminal cluster, those of the male plant bright yellow, the female ones usually purple; follicles reddish, plump, and erect.

The succulent young stems and leaves of the roseroot are edible and may be used as salad or pot-herb. Where present the roseroot is generally abundant and provides a palatable and readily available vegetable.

Moist rocky ledges and cliffs, especially near the sea. The species is strongly nitrophilous and for this reason favours bird cliffs and the proximity of human habitations.

General distribution: Amphi-Atlantic, subarctic-boreal. Fig. 42,a. Map 205.

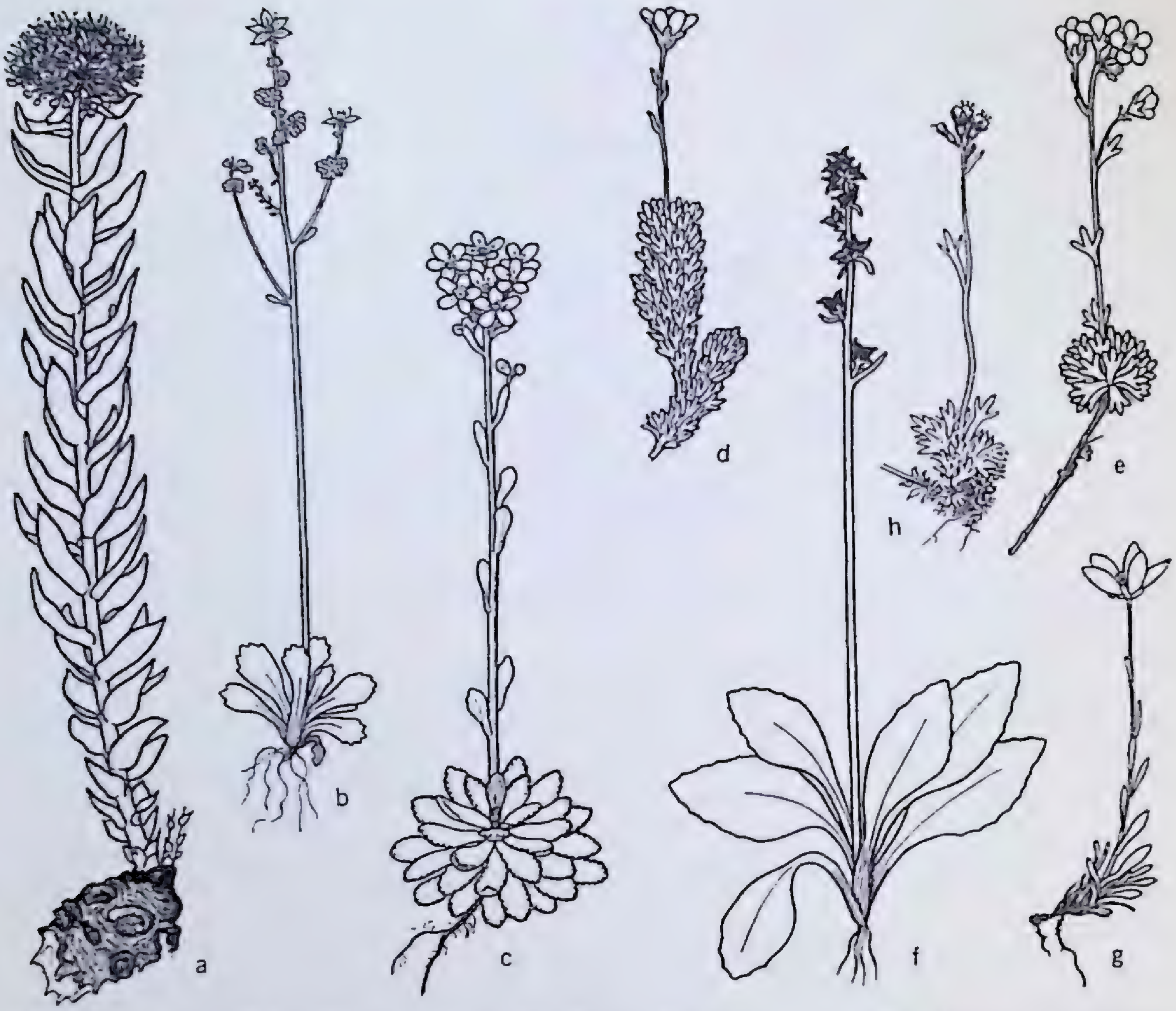

FIGURE 42. a. *Sedum Rosea.* b. *Saxifraga foliolosa.* c. *S. Aizoon* var. *neogaea.* d. *S. caespitosa* ssp. *uniflora.* e. *S. caespitosa* ssp. *eucaespitosa.* f. *S. hieracifolia.* g. *S. Hirculus* var. *propinqua.* h. *S. caespitosa* ssp. *exaratoides.* (1/2)

18. SAXIFRAGACEAE Saxifrage Family

Perennial herbs (ours) with alternate or rarely opposite leaves lacking stipules; flowers regular; calyx free or adnate to the ovary, the stamens and the petals inserted on the calyx. Fruit a capsule or follicle.

Sterile filaments none
Ovary 2-loculed; stamens 10; sepals and petals 5 each 1. Saxifraga
Ovary 1-loculed; stamens 4–8; petals none 2. Chrysosplenium
Sterile filaments (staminodia) present, alternating with the 5 regular stamens; flowers solitary, white 3. Parnassia

Saxifraga L. Saxifrage

Ours all perennial, mostly with rosulate alternate, rarely opposite leaves; flowers white, yellow, or purple. In *S. cernua* and *S. foliolosa* some or all of the flowers are replaced by bulbils or small tufts of leaves that root when detached from the mother plant.

a. Leaves opposite, small and imbricated, on matted, trailing branches; flowers purple 10. *S. oppositifolia*
a. Leaves alternate or basal; flowers white, greenish, roseate, or yellow
  b. Acaulescent scapose plants with rosulate oblong, entire, serrate, or dentate leaves; flowers white
    c. Leaves cuneate-oblong with several teeth near the apex
      d. Inflorescence mainly of bulbils 6. *S. foliolosa*
      d. Inflorescence of normal flowers 12. *S. stellaris*
    c. Leaves oval or ovate, with crenate or dentate margins
      e. Flowers in a spike-like panicle 7. *S. hieracifolia*
      e. Flowers paniculate in a terminal cluster
        f. Underside of leaves lacking coarse, rust-coloured hairs 9. *S. nivalis*
        f. Underside of leaves with coarse, rust-coloured hairs 12. *S. tenuis*
  b. Flowering stems leafy; flowers white or yellow
    g. Basal leaves entire or serrate but not toothed, lobed, or divided
      h. Flowers yellow
        i. Plant with long flabelliform naked stolons 5. *S. flagellaris*
        i. Plant without such stolons
          j. Leaves small, linear, and fleshy 1. *S. aizoides*
          j. Basal leaves oblanceolate, petioled 8. *S. Hirculus*
      h. Flowers white; leaves thick and leathery with lime-encrusted margins 2. *S. Aizoon*
    g. Basal leaves lobed, toothed, or divided
      k. Basal leaves orbicular or reniform in outline, 3–5 lobed
        l. Inflorescence of one terminal flower and lateral bulblets 4. *S. cernua*
        l. Inflorescence of several flowers, bulblets lacking 11. *S. rivularis*
      k. Basal leaves oblong-cuneate or flabelliform
        m. Leaves leathery, with 3 prickly apical lobes 13. *S. tricuspidata*
        m. Leaves soft, palmately 3–5 lobed 3. *S. caespitosa*

1. **S. aizoides** L.; Yellow Mountain Saxifrage—Low and matted; branches decumbent and trailing with somewhat imbricated, linear and fleshy leaves 0.5 to 1.5 cm. long, terminating in few-flowered racemes; petals yellow, and mostly orange-dotted.

Moist calcareous clay and gravel.

General distribution: Amphi-Atlantic, arctic-alpine. Fig. 44,b. Map 206.

2. **S. Aizoon** Jacq. var. **neogaea** Butters; White Mountain S.—Basal leaves oblanceolate or spatulate, thick and leathery, serrulate with a conspicuously lime-encrusted pore at the base of each tooth; flowering stems erect, 10 to 25 cm. high, with alternate, much-reduced leaves; inflorescence paniculate-corymbiform; petals creamy white, usually with orange spots.

Calcareous gravels and rocky ledges.

General distribution: Eastern arctic and subarctic N. America. Fig. 42,c. Map 207.

3. **S. caespitosa** L. s.lat.; Tufted Saxifrage—Caespitose, with numerous short, crowded, sterile branches; basal leaves cuneate, flabelliform, 3- or rarely 5-lobed, the lobes linear-oblong, obtuse. Flowering stems slender, erect, 5 to 20 cm. high, glandular, especially above, with one to several

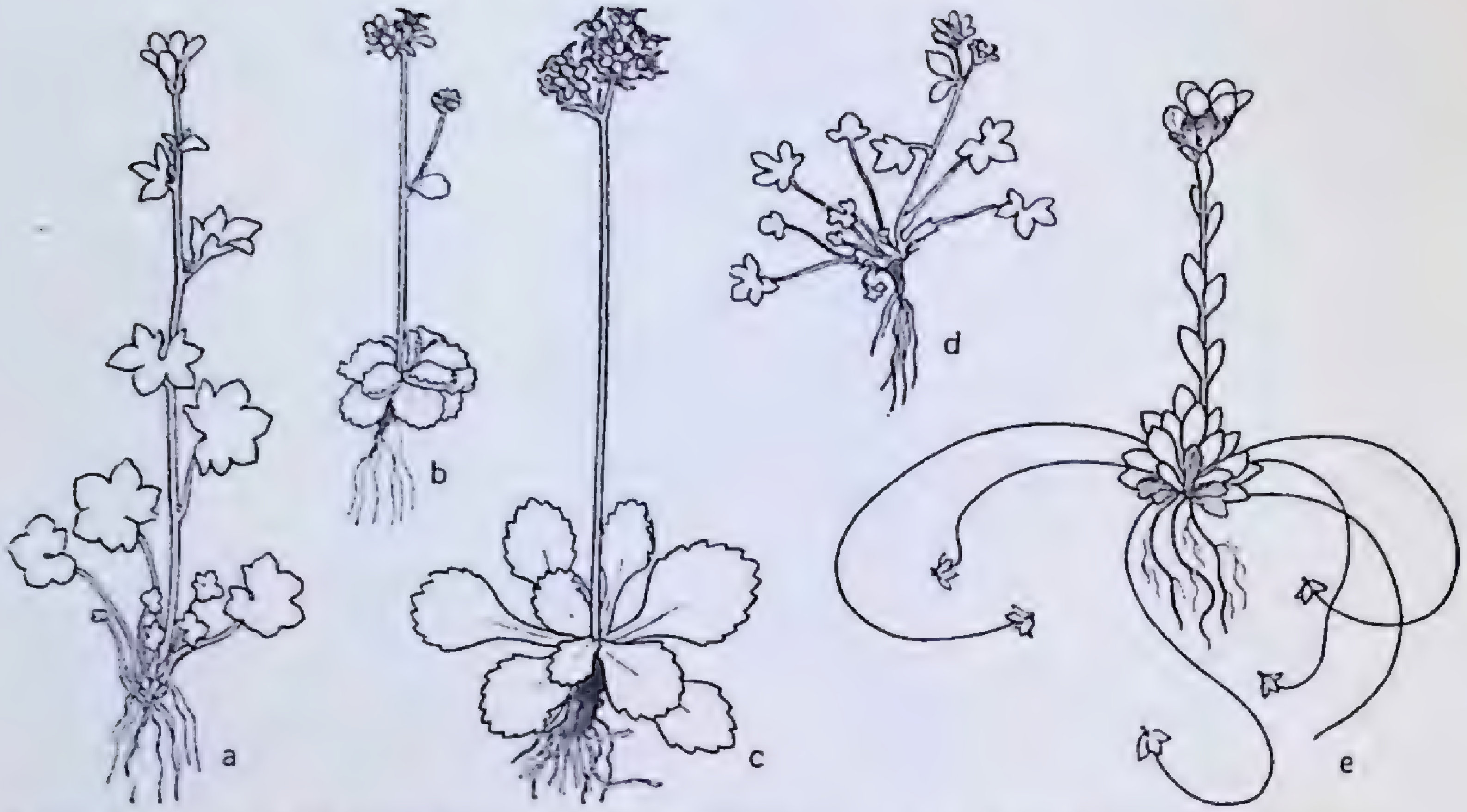

FIGURE 43. a. *Saxifraga cernua.* b. *S. tenuis.* c. *S. nivalis.* d. *S. rivularis.* e. *S. flagellaris* ssp. *platysepala.* (1/2)

reduced leaves. Flowers solitary or several together, in an open corymb; petals creamy white, broader and longer than the triangular and glandular calyx lobes.

A polymorphous species which in N. America is represented by a number of more or less well-marked geographical races, of which three enter our area:

Flowers large, 8–10 mm. high, usually 3, rarely 1 or 2	ssp. *eucaespitosa* Engl. & Irmsch. [*S. groenlandica* L.]
Flowers smaller, 4–7 mm. high	
Flowers mostly solitary, calyx purplish black	ssp. *uniflora* (R. Br.) Porsild
Flowers mostly 3, calyx greenish-purple	ssp. *exaratoides* (Simm.) Engl. & Irmsch. emend. Porsild[1]

Rocky ledges and gravelly places. Ssp. *uniflora* and ssp. *exaratoides* pronounced calciphiles.

General distribution: Ssp. *eucaespitosa*: Amphi-Atlantic, subarctic, FIG. 42,e. MAP 208. Ssp. *uniflora*: Circumpolar (with large gaps); high-arctic; FIG. 42, d, MAP 209. Ssp. *exaratoides*: endemic to Palæozoic parts of Hudson Bay region, north to S. Ellesmere Island, FIG. 42,h, MAP 210.

4. **S. cernua** L.; NODDING SAXIFRAGE—Stems slender, erect, simple, and leafy, 10 to 25 cm. high, with a cluster of white bulblets hidden at their bases. Basal and lower cauline leaves reniform 3 to 5 lobed, petioled, upper stem leaves reduced, bract-like, subtending clusters of small purple bulbils. Flower single and terminal or sometimes lacking, nodding in youth; petals white, 5 to 12 mm. long.

Moist ledges and gravelly places, sometimes in moss or wet sand by brooks and lake shores.

General distribution: Circumpolar, widespread arctic-alpine. FIG. 43,a. MAP 211.

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[1] *See* Porsild, A. E. (1955). National Museum of Canada, Bull. 135, p. 135.

5. **S. flagellaris** Willd. ssp. **platysepala** (Trautv.) Porsild; SPIDER PLANT—Stems single, erect, leafy, and glandular, 3 to 15 cm. high, from a basal rosette, from which issue long, filiform, naked stolons that terminate in tiny rooting rosettes. Leaves entire, oblanceolate, acute, the basal ones with margins beset with a single row of spine-like, pale bristles; those of the stem narrower and glandular-ciliate. Flowers 1 to 3, funnel-shaped, large, with pale yellow petals twice as long as the broadly oval, purple, densely glandular sepals.

Wet calcareous gravel barrens.

General distribution: Amphi-Atlantic, high-arctic. From Banks Island across the northern islands of the Archipelago to northern E. and W. Greenland, Spitsbergen, Novaya Zemlya, and arctic W. Asia. FIG. 43,e. MAP 212.

6. **S. foliolosa** R. Br.—Tufted, with a short and often branched caudex, from which often issue short, slender, leafy stolons terminating in leafy rosettes. Leaves all basal and rosulate, cuneate-oblanceolate to spatulate, thin and fresh green, serrate or toothed above the middle. Scapes slender, erect, simple or branched above, 5 to 25 cm. high. Inflorescence racemose or paniculate, the flowers largely replaced by bulblets or small leafy buds, but in large specimens usually with a single normal flower at the end of each branch. Petals white, lanceolate, with a short claw.

Mossy and springy places, often by the edge of brooks, by lake sides or in wet tundra.

General distribution: Circumpolar, wide-ranging, high-arctic. FIG. 42,b. MAP 213.

7. **S. hieracifolia** Waldst. & Kit.—Tufted perennial from a short, thick caudex. Leaves all basal and rosulate, essentially glabrous, oblong-lanceolate, short petiolate, 3 to 5 cm. long, entire, with serrate to coarsely toothed margins. Scapes 10 to 50 cm. high; flowers in small dense clusters in an interrupted, spike-like raceme, the lowermost subtended by leafy bracts. Flowers small and inconspicuous with greenish-purple petals about as long as the sepals; follicles widely divergent, plump, purplish black, 5 to 7 mm. long.

Uncommon and sporadic, in rather moist, turfy, and chiefly calcareous habitats.

General distribution: Circumpolar, arctic. FIG. 42,f. MAP 214.

8. **S. Hirculus** L. var. **propinqua** (R. Br.) Simm.; YELLOW MARSH SAXIFRAGE—Tufted perennial with freely branching caudices bearing numerous glabrous and entire, petiolate, lanceolate-ligulate, obtuse leaves 1 to 4 cm. long and about 2 mm. wide. Flowering stems erect, bearing 3 to 4 linear, sessile leaves, 5 to 25 cm. high, glabrous below, rufous pubescent below the hypanthium; flowers mostly solitary, nodding at first; petals pale yellow, elliptic, clawless, about 1.0 cm. long, about twice as long as the oblong elliptic, rufous-ciliated sepals; follicles 8 to 12 mm. long, joined almost to the slightly spreading tips.

Common in rather wet tundra and in moss by brooks and lake shores.

General distribution: *S. Hirculus* s.lat.: Circumpolar, arctic-alpine; var. *propinqua:* Arctic central and eastern N. America. FIG. 42,g. MAP 215.

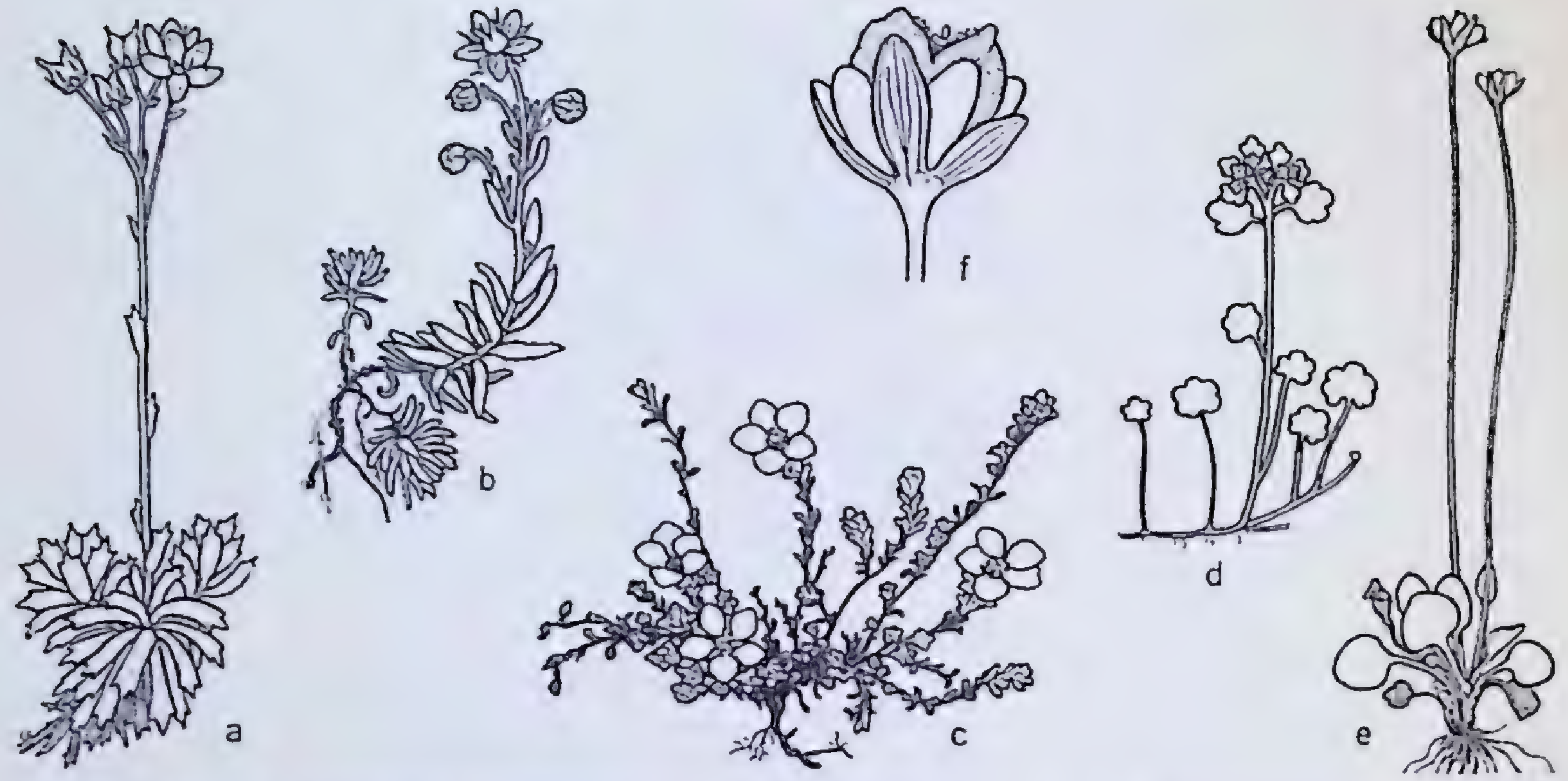

FIGURE 44. a. *Saxifraga tricuspidata.* b. S. *aizoides.* c. *S. oppositifolia.* d. *Chrysosplenium tetrandrum.* e, f. *Parnassia Kotzebuei.* (1/2)

9. **S. nivalis** L.; Alpine Saxifrage—Scapose, tufted perennial with black, fibrous roots and spreading somewhat leathery basal leaves 2 to 4 cm. long; the blade oval, obtuse, crenate-serrate, abruptly tapering into a broad petiole, dark-green above, reddish-purple beneath, glabrous except for the pubescent margins. Scapes erect and slender, solitary or a few together, 5 to 20 cm. high, purple and glandular-viscid. Inflorescence simple or branched, the small flowers in dense clusters, each subtended by a small bract. Petals white, 2 to 3 mm. long, somewhat clawed, only slightly longer than the deltoid, purple sepals. Follicles 3 to 4 mm. long, plump, with widely spreading tips.

Dry, rocky slopes and ledges, chiefly on Precambrian or acid rocks.

General distribution: Circumpolar, arctic. Fig. 43,c. Map 216.

10. **S. oppositifolia** L.; Purple Saxifrage—Densely or loosely matted with condensed, crowded, or trailing branches with imbricated, scale-like, 4-ranked, leathery, marcescent and bristly-ciliated leaves. Flowering peduncles 1 to 3 cm. long, dark purple, usually with a few alternate, linear leaves, terminating in a single flower. Petals lilac or purple, very rarely white, elliptic to oval, 6 to 9 mm. long, much longer than the ovate, bristly-ciliate sepals; follicles 6 to 8 mm. long with slender, widely spreading tips.

Common in moist, calcareous gravels and on wet cliffs.

General distribution: Circumpolar, wide-ranging arctic-alpine. Fig. 44,c. Map 217.

S. punctata L. ssp. **insularis** Hult.—Acaulescent, mostly glabrous, from a creeping rhizome. Leaves long-petioled, the blades suborbicular, coarsely few-toothed; scapes 15 to 25 cm. high, terminating in a short raceme of white or purplish flowers.

Moist, turfy places. Arctic. N.W. America.

S. reflexa Hook.—Similar to No. 9 but at once distinguished by its more open inflorescence, reflexed sepals, and clavate filaments.

Dry, calcareous slopes and ledges. Alaska, Yukon, and N.W. Mackenzie.

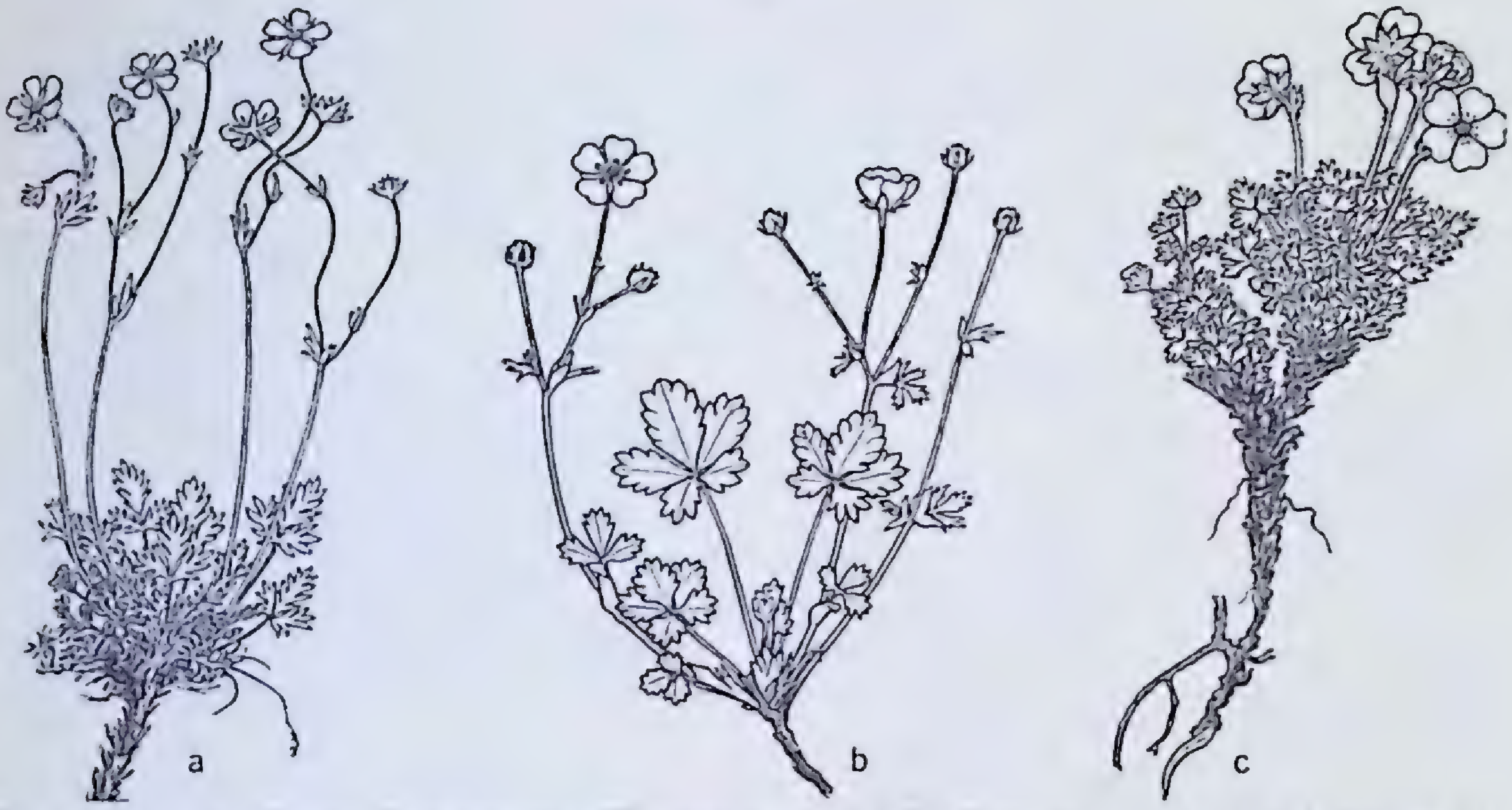

FIGURE 45. a. *Potentilla nivea* ssp. *Hookeriana*. b. *P. Crantzii*. c. *P. Vahliana*. (2/5)

11. **S. rivularis** L. s.lat.; BROOK SAXIFRAGE—Tufted dwarf species with reniform, palmately 3- to 5-lobed, essentially glabrous, slender-petioled basal leaves. Flowering stems 3 to 6 cm. high, capillary, 1- to 3-leaved, soft pubescent, bearing 1 to 5 small flowers. Petals oblong-ovate, 3 to 5 mm. long, white or pale pink, twice as long as the oblong-ovate sepals. Follicles 3 to 6 mm. long, joined almost to the short, spreading tips.

Wet, gravelly, and mossy places on wet cliffs and by brooks; a pronounced nitrophile frequently growing on wet slopes below bird cliffs and near human habitations.

General distribution: Circumpolar, wide-ranging, arctic-alpine. FIG. 43,d. MAP 218.

12. **S. stellaris** L.—Similar to *S. foliolosa* but inflorescence of normal, fertile flowers, without bulbils or leafy buds. The lateral branches ascending, often overtopping the central flower. Petals white with two yellow spots at their base.

In mossy and springy places, usually by brooks. In our area thus far collected but once, and nearly one hundred years ago, in S. Baffin Island.

General distribution: Amphi-Atlantic, subarctic-alpine. MAP 219.

13. **S. tenuis** Sm.—Resembling *S. nivalis* but at once distinguished by its lower stature and more delicate habit, its few flowers, and more open inflorescence, and by the presence of coarse, rust-coloured hairs on the underside of the leaves and on the petioles.

Wet, gravelly places or in wet moss on cliffs, by brooks, or by lake shores.

General distribution: Amphi-Atlantic, arctic. FIG. 43,b. MAP 220.

14. **S. tricuspidata** Rottb.; PRICKLY SAXIFRAGE—Densely matted, often forming large flat cushions; the leaves of the densely crowded branches often reddish tinged, rigid, leathery, and long marcescent, cuneate-spatulate with 3 prickly, toothlike lobes at the apex. Flowering stems 6 to 15 cm.

tall, leafy. Inflorescence corymbose, nodding in youth; petals elliptic-oblong, clawless, 6 to 7 mm. long, creamy white and usually orange-dotted, much longer than the obtuse, somewhat ciliate sepals.

Dry, rocky and gravelly places.

General distribution: N. American wide-ranging, arctic-alpine. Fig. 44,a. Map 221.

2. Chrysosplenium L. Golden Saxifrage

C. tetrandrum (Lund) Fries—Small, delicate, yellowish-green, essentially glabrous perennial, with a slender, creeping rootstock. Leaves alternate, reniform, shallowly 3- to 7-lobed, the lower slender-petioled, the upper short-petioled or sessile. Flowering stems 3 to 10 cm. high, ascending-erect, branched above; flowers small and inconspicuous, in small clusters in the axils of the upper leaves; sepals 4, bright yellow; petals none; stamens usually 4, but not infrequently 6 to 8 (*C. iowense* auctt., non Rydb.); seeds small, numerous, and shiny.

Moist, somewhat shady places in soil enriched by animal manure, hence frequently growing among ruins of former Eskimo dwellings, inside collapsed stone burials and meat caches, or near animal dens.

General distribution: Circumpolar, arctic. Fig. 44,d. Map 222.

3. Parnassia L. Grass-of-Parnassus

P. Kotzebuei Cham. & Schlecht.—Glabrous perennial with a short erect-ascending rootstock. Leaves broadly ovate-cordate, petioled to subsessile. Scapes slender, 6 to 20 cm. high, one to several, leafless or with a single sessile leaf inserted near the base. Flower solitary; sepals oblong, 5 to 7 mm. long, equalling or exceeding the elliptic-oval white petals; staminodia short, with 3 to 5 filaments; capsule ovoid, twice as long as the calyx.

Rare in moist, turfy places, occasionally in wet sand by lake shores. In our area thus far known only from a single station on the south coast of Baffin Island.

General distribution: Wide-ranging N. American, low-arctic–alpine. Fig. 44,e,f. Map 223.

P. palustris L. var. **neogaea** Fern.—Similar but the flower much larger, with broader and longer petals; the cauline leaf inserted near the middle of the stem.

Wet, calcareous soil, often in herbmats or by brooks or ponds. Alaska to Labrador.

19. ROSACEAE Rose Family

Ours perennial herbs or dwarf shrubs, with alternate, stipulate leaves and regular, perfect flowers containing 5 sepals, 5 to 8 petals, and 5 to numerous stamens inserted in the calyx. Carpels several to many, becoming dry achenes or drupelets.

- Carpels numerous, forming juicy drupelets, crowded on a spongy receptacle 1. Rubus
- Carpels becoming dry achenes
  - Styles deciduous, not elongating after anthesis
    - Stamens numerous 2. Potentilla
    - Stamens 5 3. Sibbaldia
  - Styles persistent and elongating after anthesis
    - Dwarf shrubs with simple leaves and solitary flowers on slender scapes 4. Dryas
    - Herbs with pinnate leaves and leafy flowering stems 5. Geum

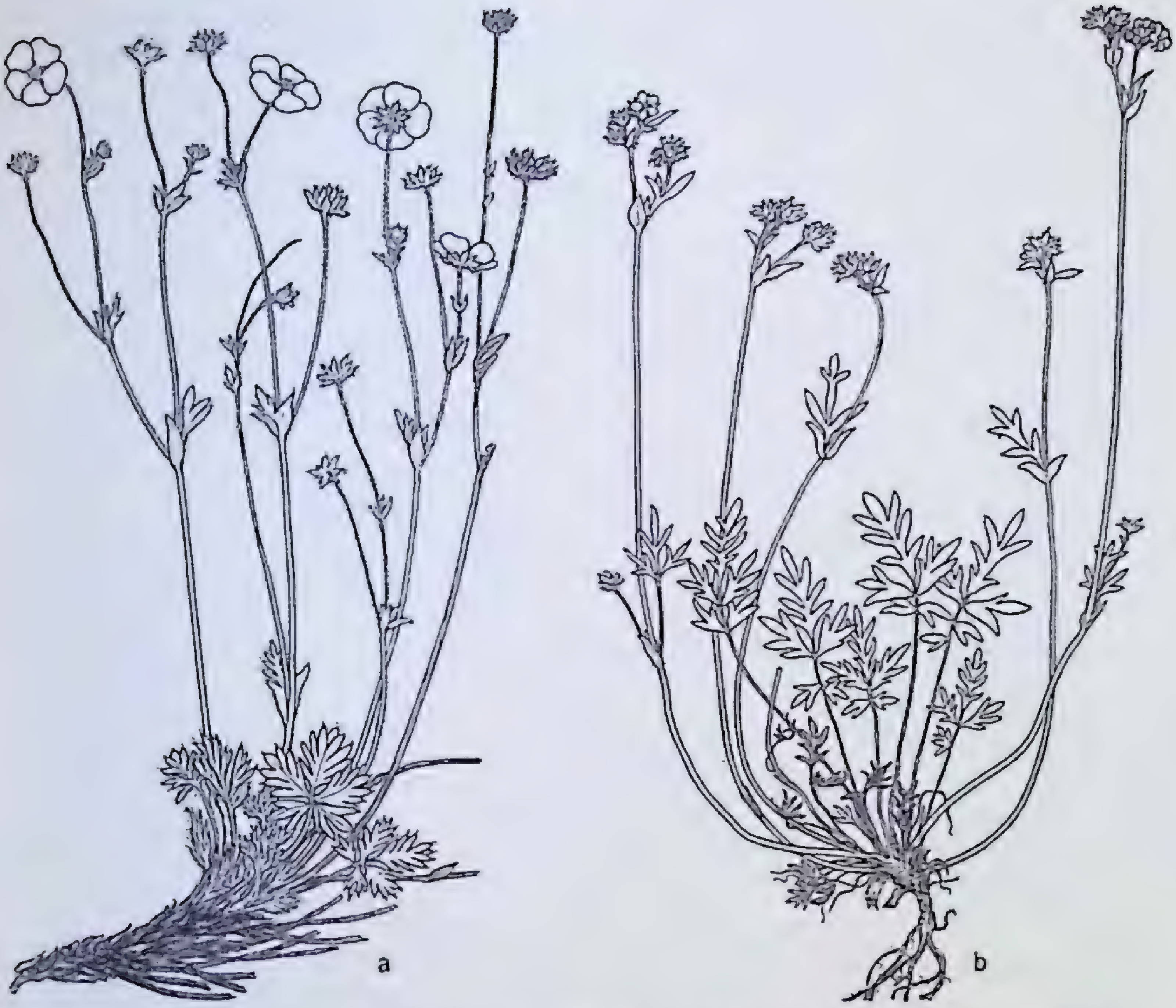

FIGURE 46. a. *Potentilla rubricaulis.* b. *P. pulchella* var. *gracilicaulis.* (2/5)

1. RUBUS L. Bramble

R. Chamaemorus L.; CLOUDBERRY or BAKED-APPLE—Dioecious, low, creeping, glabrous herb with large, round-reniform, mostly 5-lobed, serrate, and somewhat leathery leaves; stems simple, erect, bearing 1 to 3 leaves and terminating in a solitary, large, white flower. The immature fruit first bright red, later amber-coloured, and closely embraced in the calyx. When ripe, the calyx lobes become reflexed and the large fruit turns soft and pale yellow.

Moist peaty and turfy places; barely entering our area where it probably does not fruit. The baked-apple is the favourite native fruit of the Eskimo, who preserve it in seal oil.

General distribution: Circumpolar, low-arctic. FIG. 48,b. MAP 224.

2. POTENTILLA L. Cinquefoil

Tufted or caespitose perennial herbs with freely branched and mostly sub-ligneous caudices that are often covered by the marcescent remains of former year's leaves. Radical leaves compound; flowering stems erect, simple or branched. Flowers 5-merous, solitary or in cymes; in ours the petals are yellow. Fruits of small, dry achenes inserted on the hemispherical dry, often hairy receptacle.

- a. Basal leaves digitate
  - b. Basal leaves ternate, or rarely with an auxillary pair of much reduced leaflets
    - c. Leaves densely white- or yellowish hirsute-tomentose beneath
      - d. Flowers in cymes, plant loosely tufted
        - e. Leaves merely white-tomentose beneath, not shaggy from long, silky guard-hairs; dark green and essentially glabrous above 4. *P. nivea* s.lat.
        - e. Leaves shaggy beneath from long, silky guard-hairs above the tomentum 6. *P. rubricaulis*
      - d. Flowers solitary or rarely 2 or 3; plant densely tufted or matted and very hirsute throughout, even to the upper leaf-surfaces; the long, silky guard-hairs pale yellowish 7. *P. Vahliana*
    - c. Leaves merely hirsute beneath, lacking a true tomentum 3. *P. hyparctica*
  - b. Basal leaves always quinate 1. *P. Crantzii*
- a. Basal leaves pinnate
  - f. Flowers solitary; plant with long cordlike and freely rooting runners 2. *P. Egedii* var. *groenlandica*
  - f. Flowers in cymes; plant without runners
    - g. Flowers small, 1 cm. or less in diameter; the petals barely exceeding the sepals; stems low and decumbent, or erect-ascending in var. *gracilicaulis* 5. *P. pulchella*
    - g. Flowers large, 1.5 to 2.5 cm. in diameter; stems tall, erect or ascending 6. *P. rubricaulis*

1. **P. Crantzii** Beck—Loosely tufted or matted with a freely branching sub-ligneous caudex. Basal leaves quinate and long-petiolate, the blade fresh green, glabrate above, sparingly villous below and chiefly on the ribs. Flowering stem erect-ascending, 15 to 25 cm. high, freely branching; flowers long-pedunculate; petals pale yellow with a dark orange base.

In herbmats and among willows. In our area thus far recorded but once from S. Baffin Island.

General distribution: Amphi-Atlantic, subarctic. FIG. 45,b. MAP 225.

P. diversifolia Lehm. ssp. **Ranunculus** (Lge). Porsild; *P. Ranunculus* Lge.—Loosely tufted with a stout, subligneous, branching caudex thickly covered by the marcescent remains of stipules and petioles. Basal leaves digitately 5-foliate, glaucous, and almost glabrous. Flowering stems erect-ascending, 15 to 40 cm. high, 2- to 5-flowered. Petals pale yellow.

Herbmats and grassy slopes. A rare species thus far known from widely disjunct stations in E. and W. Greenland, and from one station in Labrador.

2. **P. Egedii** Wormskj. var. **groenlandica** (Tratt.) Polunin—Tufted with a short, thick, branched caudex ending in a rosette of interruptedly pinnate leaves and producing long, slender, freely rooting, flowering stolons. Flowers solitary on slender, naked peduncles; the petals pale yellow.

Wet brackish meadows, or in moist-sandy or rocky places by the seacoast.

General distribution: American, subarctic. FIG. 48,d. MAP 226.

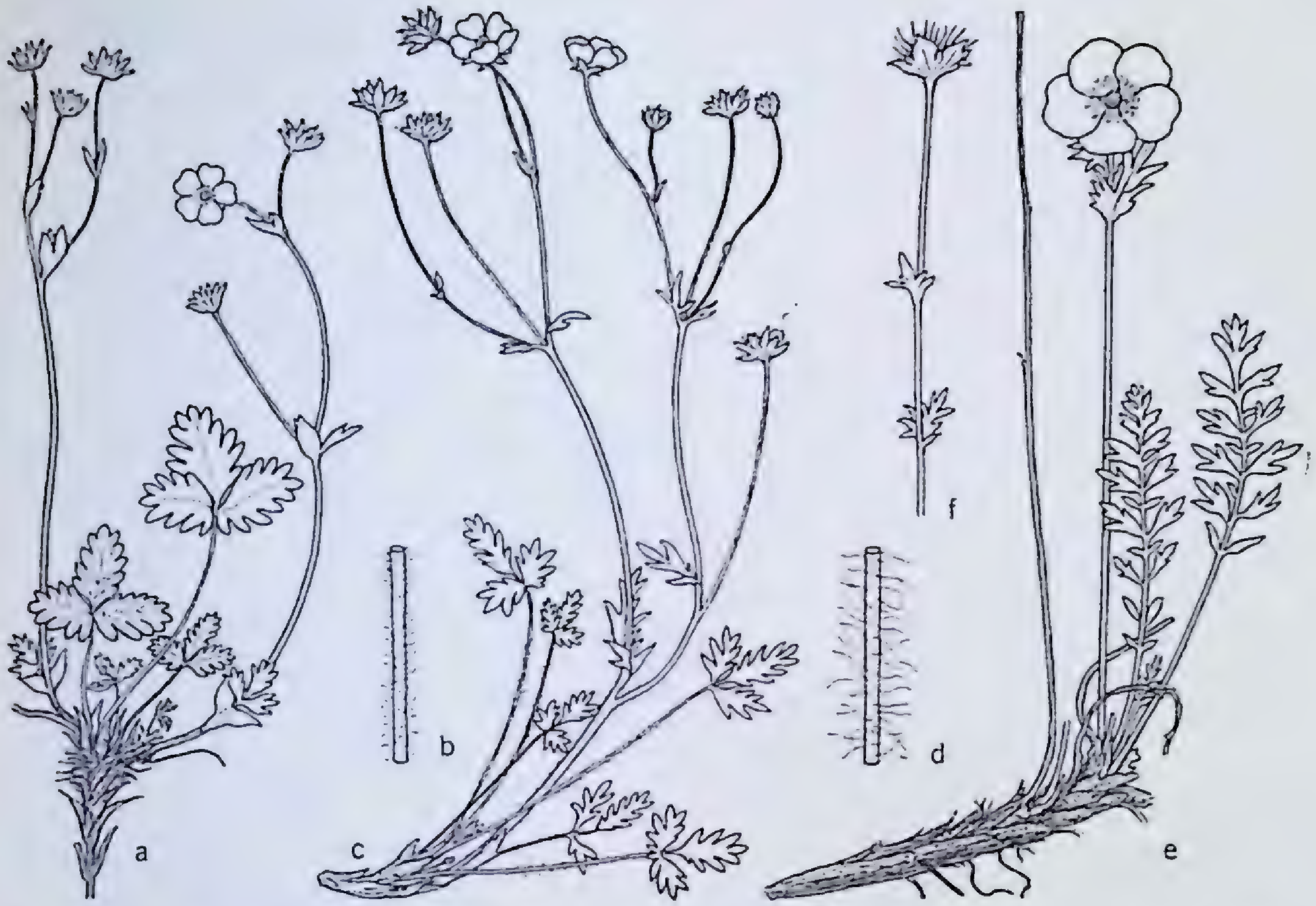

FIGURE 47. a, b. *Potentilla nivea* s. str. c,d. *P. nivea* ssp. *Chamissonis.* e, f. *Geum Rossii.* (2/5; b and d 2/1]

3. **P. hyparctica** Malte; *P. emarginata* Pursh not Desf.—Densely tufted with the branches of the caudex covered by marcescent brown stipules. Leaves all ternate, green, and sparingly villous above, paler and thinly soft pubescent below; leaf petioles 3 to 4 times as long as the blade and long-villous. Flowering stems erect-ascending and often somewhat flexuous, 5 to 12 cm. high, usually 1- to 3-flowered; flowers about 1.5 cm. in diameter, the petals very pale yellow, obcordate, and prominently emarginate.

In the southern part of its range *P. hyparctica* gradually merges with its taller and larger flowered var. *elatior* (Abrom.) Fern.

Rocky places such as ravines and talus slopes; often by the edge of snowbeds.

General distribution: Circumpolar, wide-ranging, arctic. FIG. 48,c. MAP 227.

4. **P. nivea** L. s.lat.—Loosely tufted with a freely branched caudex. Leaves ternate, dark green and glabrous above, dull white-tomentose to glabrate below. Flowering stems erect-ascending, freely branched, 15 to 25 cm. high, 3- to 15-flowered.

Potentilla nivea is represented in North America by several well-marked geographical races, of which, in addition to the typical plant, an eastern and a western race enter our area.

Leaf petioles merely tomentose, lacking long, spreading, or appressed guard-hairs *P. nivea* s. str
Leaf petioles with long and spreading hairs several times longer than the diameter of the petiole
  Petioles 2 to 3 times as long as the blade, with a short, dense pubescence beneath the long guard-hairs; flowers small, in rather dense cymes *P. nivea* ssp. *Hookeriana*
  Petioles longer, without a dense pubescence of short hairs beneath the long guard-hairs *P. nivea* ssp. *Chamissonis*

Common and widespread in rocky and sunny places; often near animal burrows and below bird cliffs. The leaves and stems of *Potentilla nivea* are said to be a particularly rich source of vitamin C.

General distribution: Arctic-subarctic. *P. nivea* s.str.: Amphi-Atlantic, arctic-alpine, FIG. 47,a,b, MAP 228. Ssp. *Chamissonis:* Amphi-Atlantic, arctic, FIG. 47, c,d. MAP 230. Ssp. *Hookeriana:* Asia–N.W. America, arctic-alpine, FIG. 45,a, MAP 229.

5. **P. pulchella** Pursh—Caespitose or tufted with decumbent or arching 1- to 3-flowered stems. Basal leaves pinnate, with from 3 to 5 deeply incised linear-lanceolate leaflets; the terminal and the first pair largest, the second pair smaller or sometimes much reduced or absent, glabrate above, silky-tomentose beneath; petioles silky-villous, stipules large and prominent, essentially glabrous, rusty-brown. Flowers small, the petals retuse, pale yellow, not much longer than the calyx. In the western islands often represented by var. *gracilicaulis* Porsild, which differs from typical *P. pulchella* by its erect-ascending flowering stems, 25 to 30 cm. high, and by its less hirsute leaves.

Common in sandy and gravelly places and in dry tundra; although perhaps not truly halophilous, the species usually grows on strand-flats associated with seashore species.

General distribution: Amphi-Atlantic, high-arctic. FIG. 46,b. (var. *gracilicaulis*). MAP 231.

6. **P. rubricaulis** Lehm.—Caespitose with a very stout, sub-ligneous and freely branched caudex covered by dark brown marcescent remains of old leaves; flowering stems stout, reddish-brown under the long, white pubescence, erect-ascending, 10 to 30 cm. high, freely forked, few- to many-flowered. Basal leaves 5 to 8 cm. long, the blade about half as long as the densely white-villous petiole, cordate-obovate, pinnate, usually with 5 approximate leaflets, these oblanceolate, deeply cleft into linear-lanceolate teeth, in youth sparingly white-villous above, glabrate in age, the underside densely covered by a long, soft, silky-white tomentum, which is drawn out at the tip of each tooth into a conspicuous white, brush-like tuft; the glabrous stipules large and rusty brown. Flowers 3 to 7, large, 1.5 to 2.5 cm. in diameter, with dark yellow, oblanceolate petals, overlapping each other, much longer than the silky-villous sepals.

A very showy species which forms large cushion-like mats, and on the limestone barrens of Victoria and Banks islands it is one of the dominant species. In the Far North and in exposed situations sometimes represented by a lower and more compact, 1- to few-flowered form which may appear to be 3-foliate. A close examination will, however, nearly always reveal a second, if much reduced, pair of leaflets.

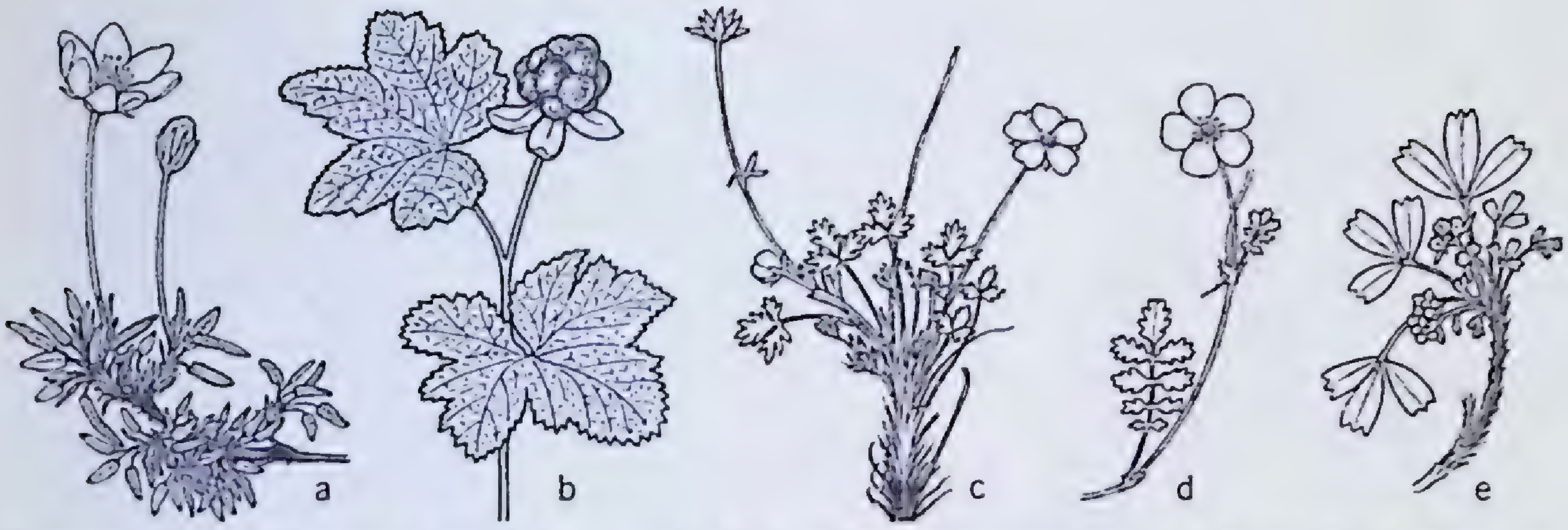

FIGURE 48. a. *Dryas integrifolia.* b. *Rubus Chamaemorus.* c. *Potentilla hyparctica.* d. *P. Egedii.* e. *Sibbaldia procumbens.* (2/5)

General distribution: Endemic of the Arctic Archipelago, the adjacent mainland, and northern Greenland. FIG. 46,a. MAP 232.

P. tridentata Sol.—A dwarf species with a sub-ligneous creeping stem, leathery, evergreen 3-foliate leaves and small white flowers in open cymes.

Dry, rocky, gravelly or sandy places on Precambrian rock. Southern E. and W. Greenland, Labrador to Lake Athabasca, south to Newfoundland and mts. in eastern Nova Scotia, Great Lakes region, Alberta to N. Dak.

7. **P. Vahliana** Lehm.—Densely caespitose with stout, compact, subligneous, branching caudices covered with the brown marcescent remains of old leaves; flowering stems scapose, 5 to 10 cm. high, 1- to 2-flowered, densely covered with long, yellowish hairs; basal leaves short-petioled, ternate, densely silky-villous above, tomentose and densely yellowish silky below; leaflets cuneate, deeply cleft into linear-lanceolate teeth. Flowers 1.5 to 2.0 cm. in diameter; calyx yellowish silky-villous; petals broadly obcordate, overlapping each other, deep yellow with a dark orange base, twice as long as the sepals.

P. Vahliana is a pronounced calciphile and is common on the limestone barrens of the Archipelago where it forms large cushions often one metre in diameter, that at the time of flowering may be completely covered by the large, showy flowers.

General distribution: High-arctic, endemic of the Arctic Archipelago and adjacent mainland and W. Greenland. FIG. 45,c. MAP 233.

3. SIBBALDIA L.

S. procumbens L.—Low, depressed, and matted, with freely branched and creeping rootstocks; flowering stems 10 cm. high or less, villous, few-leaved; basal leaves ternate, sparsely appressed pilose, on short slender petioles. Flowers small and inconspicuous in few-flowered, dense cymes. Petals 5, linear-oblong, minute, shorter than the sepals, stamens 5.

In moist, gravelly places, in herbmats and places where the snow remains late.

General distribution: Circumpolar (with large gaps), subarctic-alpine. FIG. 48,e. MAP 234.

4. DRYAS L. Mountain Avens

Leaves entire or at most crenate in the lower half	1. *D. integrifolia*
Leaves crenate-serrate in their entire length	2. *D. punctata*

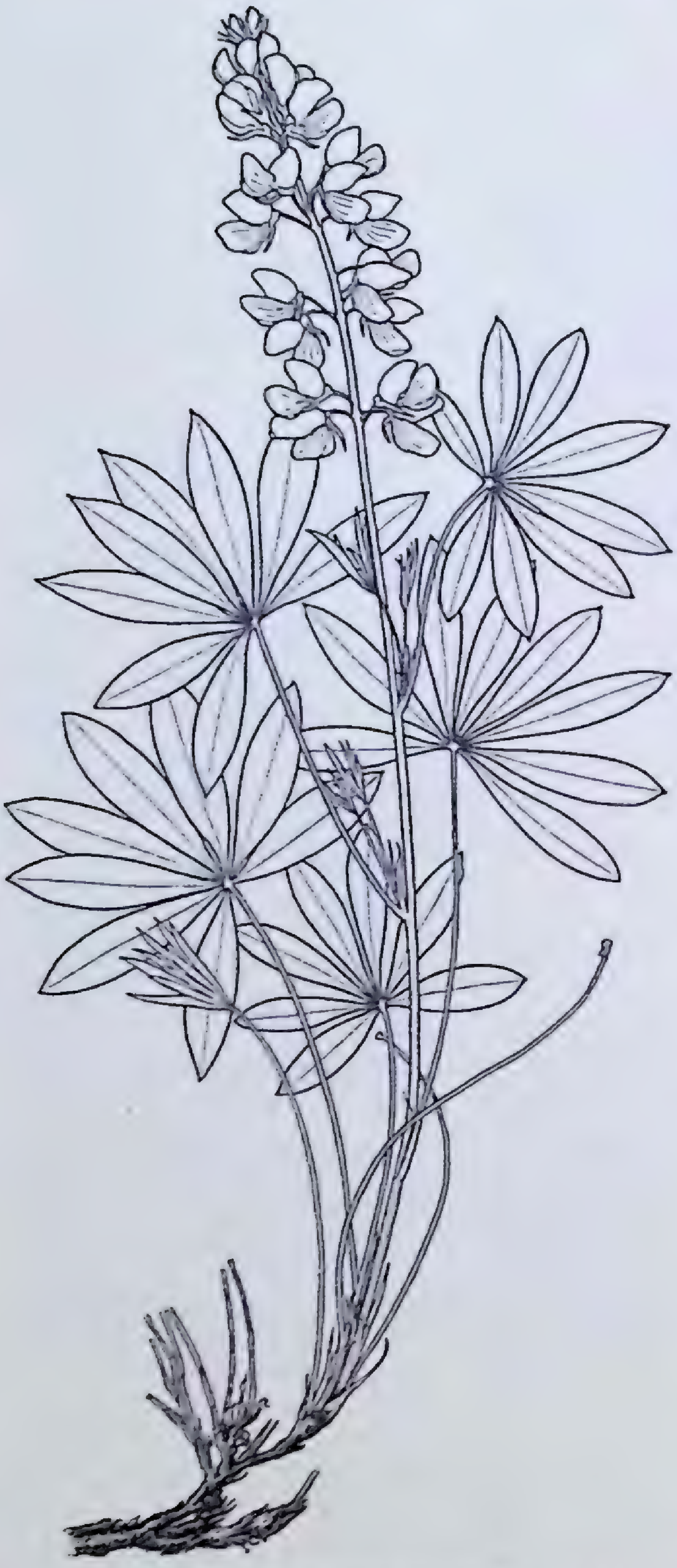

FIGURE 49. *Lupinus arcticus.* (2/5)

1. **D. integrifolia** M. Vahl—Caespitose, depressed dwarf shrub with short horizontal rooting branches, alternate, petioled, simple leaves and solitary flowers on naked peduncles. Leaf-blades lanceolate, truncate, or subcordate at the base, usually with strongly revolute margins, glabrate and shiny above, densely white tomentose beneath, the nerves lacking branched and brownish hairs. Scapes 5 to 15 cm. high, black glandular-hirsute; hypanthium saucer-shaped, sepals linear-lanceolate, petals white, 8 to 12 mm. long, styles plumose, 2.5 to 3.0 cm. long in fruit.

An ubiquitous pioneer species on frost-heaved, calcareous, gravelly, and rocky barrens and in the western islands probably is the most common and widespread phanerogam.

General distribution: N. America, wide-ranging, arctic.
FIG. 48,a. MAP 235.

2. **D. punctata** Juz.—Similar, but in our area a smaller plant, differing from *D. integrifolia* by its crenate-serrate leaves that are often tightly rolled, hirtellous, and rugose, not shiny, on the upper surface. The nerves of the underside are beset with sessile or short-stalked yellowish-brown glands and tufts · of branched, brownish hairs.

Rare and local in calcareous, gravelly places.

General distribution: Circumpolar (with large gaps), high-arctic. MAP 236.

5. GEUM L.

G. Rossii (R. Br.) Sér.—Essentially glabrous herb with a very stout ascending, sub-ligneous caudex, densely covered by the marcescent remains of old leaf-bases, and terminating in a rosette of 6 to 10 cm. long, erect, interruptedly pinnate leaves bearing about 7 pairs of variously toothed, cuneate leaflets. Flowering stems, one- or rarely 2-flowered, erect with a few reduced leaves, at first low but elongating in fruit, become 10 to 25 cm. high. Flowers large and showy, 2 to 3 cm. in diameter; petals pale yellow, orbicular, longer than the sepals; achenes hirsute; styles not much elongated in fruit, and not plumose.

Calcareous clay in moist, alpine tundra; often growing on solifluction lobes.

General distribution: E. Asia and arctic-alpine N.W. America. Fig. 47,e,f. Map 237.

20. LEGUMINOSAE Pea Family

Perennial herbs (ours) with alternate, compound, stipulate leaves; flowers perfect, irregular, of 5 more or less united sepals and 5 unlike petals, of which the largest and upper one is called the standard or vexillum, the two lateral and similar ones are called the wings, and below and partly enclosed by them is the keel, which is formed by the two lowermost and united petals. There are 10 stamens, of which 9 are united and only one free; the fruit is a variously-shaped pod or legume.

Leaves palmate	1. Lupinus
Leaves pinnate	
Legumes subcylindric, dehiscent	
Keel of the corolla blunt, without appendage at tip	2. Astragalus
Keel of the corolla tipped with an erect point	3. Oxytropis
Legumes flat, indehiscent, composed of several articulate sections	4. Hedysarum

1. Lupinus L. Lupine

L. arcticus Wats.—Tufted perennial with numerous palmate, sparsely pubescent, dark green leaves, and ascending-erect, 30 to 50 cm. high stems, terminating in showy racemes of large, blue-purple flowers. Legumes oblong, flattened, yellowish-villous, the dehiscent valves strongly twisted.

Moist tundra and grassy alpine slopes.

General distribution: N.W. America, arctic-alpine endemic. Figs. 49; 50,a. Map 238.

2. Astragalus L. Milk-Vetch

Ours perennial and mostly calciphilous herbs with odd-pinnate leaves and lavender or blue-purple flowers in short or elongating racemes. Legumes at least partly 2-locular by the sutures projecting inward into the locule, thus dividing the cavity lengthwise.

Legumes glabrous, more or less inflated	1. *A. Richardsonii*
Legumes pubescent, not inflated	
Legumes over 1 cm. long stipitate within the calyx	2. *A. alpinus*
Legumes less than 1 cm. long sessile within the calyx	3. *A. eucosmus*

1. **A. Richardsonii** Sheldon; *A. aboriginorum* auctt., in part; Richardson's Milk-Vetch—Coarse plant with a stout, sub-ligneous tap-root terminating in a many-headed crown and ascending leafy stems 10 to 25 cm. high. Leaves short and densely ashy-grey tomentose, with 4 to 7 pairs of linear-lanceolate leaflets about 1 cm. long. Inflorescence, axillary on peduncles 5 to 8 cm. long, short and capitate during anthesis, elongated in fruit. Flowers 10 to 20, about 1.5 cm. long, scentless; calyx densely black villous,

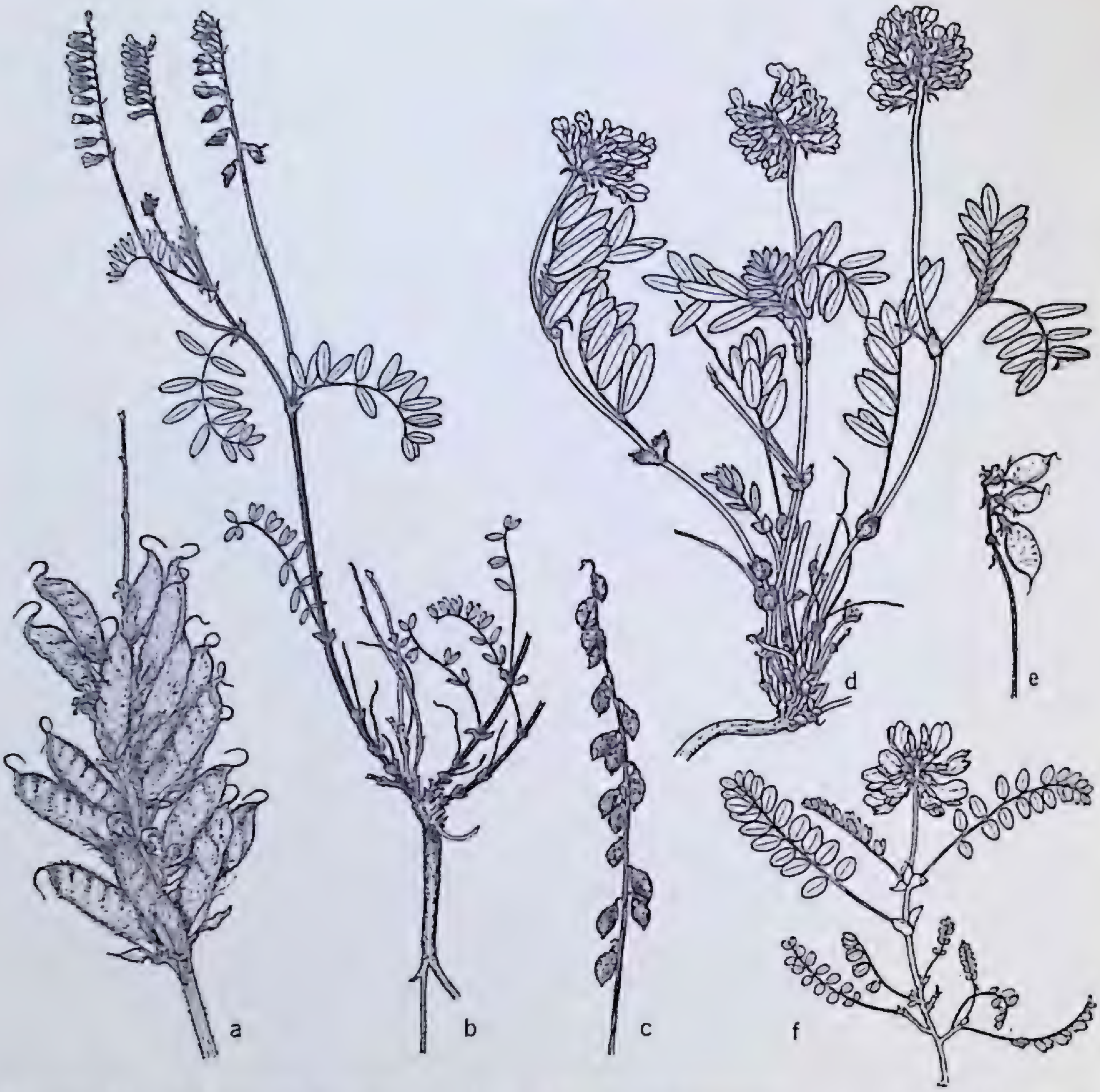

FIGURE 50. a. *Lupinus arcticus.* b, c. *Astragalus eucosmus.* d, e. *A. Richardsonii.* f. *A. alpinus.* (2/5)

half as long as the corolla in which the standard and wings are white or pale pink with prominent green veins and only the keel prominently purplish tipped. Legumes short stipitate within the calyx, glabrous even in youth, 2 cm. long when full-grown, strongly inflated and bladder-like, dark wine red and somewhat translucent.

Astragalus Richardsonii is closely related to the prairie species *A. aboriginorum*, from which it differs by larger flowers, glabrous legumes, and more densely tomentose leaves and stems.

Calcareous sandy and gravelly places.

General distribution: Endemic to northern Mackenzie and the western islands of the Arctic Archipelago. FIG. 50,d,e. MAP 239.

2. **A. alpinus** L.; ALPINE MILK-VETCH—Low and matted with creeping and freely branched weak stems. Leaflets 8 to 11 pairs, oblong-elliptic or broadly lanceolate, white-strigose beneath, glabrous or sparingly appressed

hirsute above. Peduncles axillary, longer than the leaves, terminating in short, non-elongating racemes of divergent pale bluish-violet flowers. Legumes pendulous, stipitate, and conspicuously black or brownish hirsute.

In well-watered calcareous sandy or gravelly places.

General distribution: Circumpolar, widespread arctic-subarctic. FIG. 50,f. MAP 240.

3. A. **eucosmus** Robins.—Stems slender erect, 10 to 30 cm. high from ascending, slender, branched caudices. Leaflets 4 to 8 pairs, linear-oblong to oblanceolate and obtuse, usually glabrous and green above, white-strigose beneath. Peduncles axillary, longer than the leaves, terminating in dense, but soon elongating, 6- to 16-flowered racemes of small, deep purple flowers. Legumes sessile within the calyx, pendulous on short pedicels, densely black or greyish hirsute.

Calcareous gravels, often among willows on sand and gravel bars in rivers and by sheltered lake shores.

General distribution: N. America, wide-ranging, subarctic. FIG. 50,b,c. MAP 241.

3. OXYTROPIS DC.

Ours caespitose or tufted, distinctly calciphilous perennials with stout tap-roots terminating in thick, many-headed caudices, odd-pinnate leaves, scape-like peduncles, and short spike-like inflorescences. The flowers are similar to those of the genus *Astragalus* but differ by the abruptly pointed keel and the 1-locular legumes.

- a. Stipules nearly free from the petiole; flowers and fruits reflexed or pendulous — 1. *O. foliolosa*
- a. Stipules strongly adnate to the petiole
  - b. Marcescent stipules chestnut-brown — 2. *O. Maydelliana*
  - b. Marcescent stipules papery white or grey
    - c. Leaflets opposite, sub-opposite, or alternate, but not verticillate
      - d. Low and densely caespitose or pulvinate; leaves generally less than 3 cm. long; flowers 1 or 2, violet
        - e. Leaves densely white-villous; flowers often solitary; legumes sessile within the calyx, cylindric, leathery 2–3 cm. long, black-hirsute — 3. *O. arctobia*
        - e. Leaves appressed white-silky; flowers mostly in pairs; legumes stipitate within the calyx, strongly inflated, minutely white-hairy — 4. *O. podocarpa*
      - d. Taller, loosely caespitose, not pulvinate; leaves generally 5–10 cm. long
        - f. Entire plant glandular-viscid; calyx lobes strongly glandular-verrucose
          - g. Calyx lobes deltoid, one-quarter to one-third as long as the tube — 5. *O. hudsonica*
          - g. Calyx lobes subulate, one-half to two-thirds as long as the tube — 6. *O. glutinosa*
        - f. Plant not glandular-viscid; calyx lobes not glandular-verrucose
          - h. Free part of stipules prominently white-ciliate; large plants
            - i. Flowers yellow — 7. *O. hyperborea*
            - i. Flowers violet or purple — 8. *O. arctica*
          - h. Free part of stipules sparingly if at all ciliate; low or medium plants — 9. *O. terrae-novae*
    - c. Leaflets, or at least some of them, verticillate
      - j. Flowers violet — 10. *O. Bellii*
      - j. Flowers yellow — 7. *O. hyperborea*

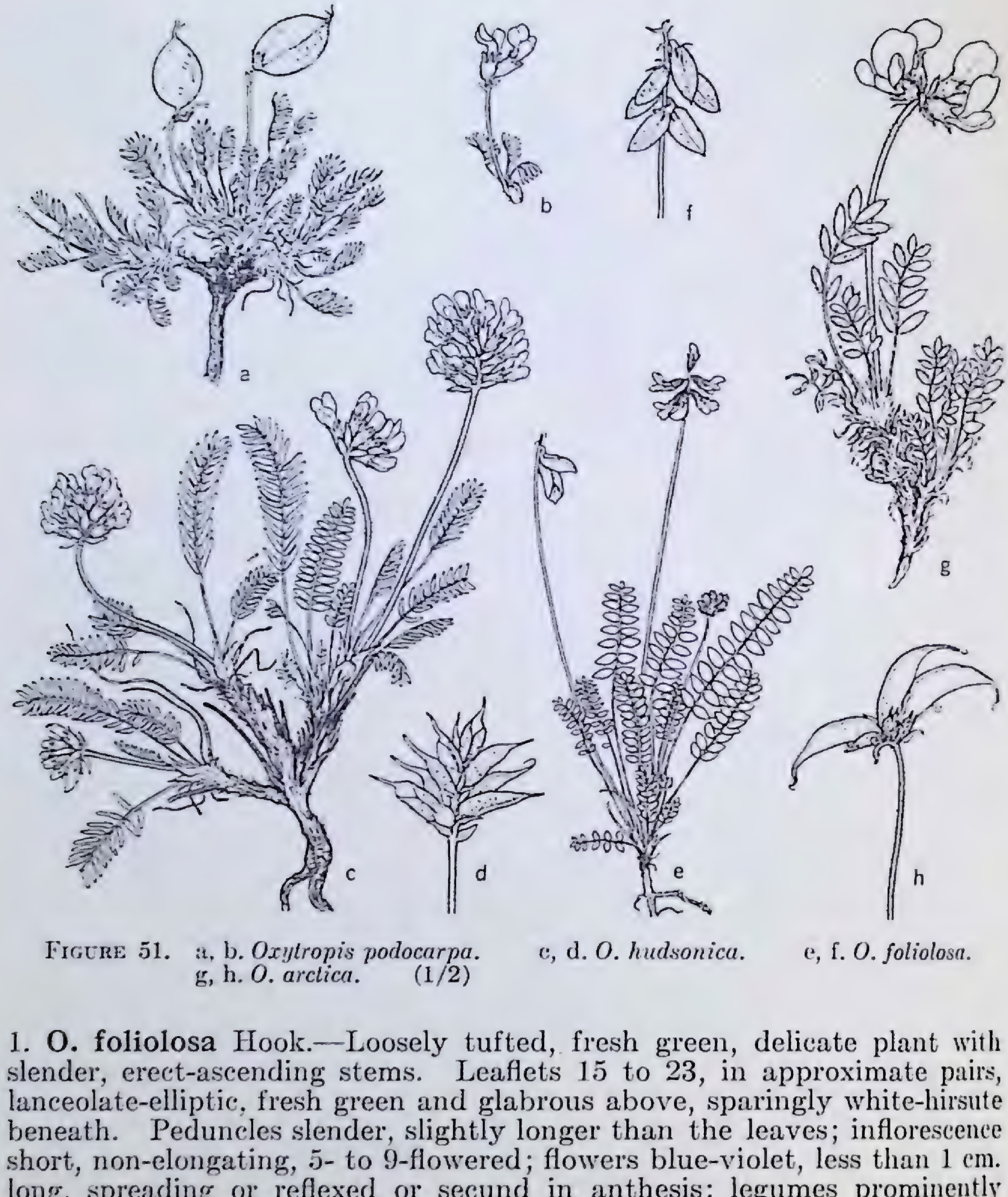

FIGURE 51. a, b. *Oxytropis podocarpa*. c, d. *O. hudsonica*. e, f. *O. foliolosa*. g, h. *O. arctica*. (1/2)

1. **O. foliolosa** Hook.—Loosely tufted, fresh green, delicate plant with slender, erect-ascending stems. Leaflets 15 to 23, in approximate pairs, lanceolate-elliptic, fresh green and glabrous above, sparingly white-hirsute beneath. Peduncles slender, slightly longer than the leaves; inflorescence short, non-elongating, 5- to 9-flowered; flowers blue-violet, less than 1 cm. long, spreading or reflexed or secund in anthesis; legumes prominently stipitate within the calyx, short, black-hairy, pendulous.

On well-watered calcareous sand and gravel bars, often under willows by rivers and lake shores.

General distribution: N. America, subarctic-alpine. FIG. 51,e,f. MAP 242.

2. **O. Maydelliana** Trautv.—Tufted, with a stout, freely branching caudex, densely covered by marcescent, chestnut-brown stipules. Leaves 3 to 6 cm. long, usually with about 13 lanceolate-oblong, acute, sparingly white-villous to glabrate leaflets. Scapes stiffly erect, 5 to 15 cm. long;

spike short, 5- to 7-flowered, not elongating in fruit. Corolla 1.0 to 1.5 cm. long, pale yellow; legumes densely black strigose beneath the long, white-villous guard-hairs, ovoid, about 1.3 cm. long and abruptly beaked.

Common in not too dry, turfy places in tundra.

General distribution: E. Asia and arctic and subarctic N. America. FIG. 53,a,b. MAP 243.

3. **O. arctobia** Bunge—Low and densely caespitose or pulvinate, forming flat or hemispherical, velvety-grey cushions that may attain a diameter of 25 to 30 cm. Leaves 1.5 to 2.0 cm. long, with 5 to 9 minute, often conduplicate, densely grey-villous leaflets. Scapes barely exceeding the leaves, 1- to 2-flowered, white- and black-villous; calyx densely black-villous; corolla purple, about 1.0 cm. long; legumes sessile within the calyx, subcylindric, 2.5 to 3.0 cm. long, black and grey-villous.

In anthesis *O. arctobia* is a strikingly handsome species when the firm, grey cushions of large individuals may be covered by several hundred flowering scapes, whereas in fruit only the large, black legumes show up against the ashy-grey foliage, which, otherwise, completely blends with the limestone gravel on which it grows.

General distribution: Endemic to the central Canadian Arctic. FIG. 52,a,b. MAP 244.

4. **O. podocarpa** Gray—Similar, but not so densely caespitose. Leaflets 7 to 13, silky-grey pubescent. Scapes slender, more or less arched, 2 to 5 cm. long, mostly 2-flowered. Corolla violet-purple, 1.5 cm. long. Legumes stipitate within the calyx, membranaceous, strongly inflated, thinly velvety-black pubescent, ovoid in outline, 3.0 cm. long including the prominent beak, 1.5 cm. wide.

General distribution: A rare species of peculiar disrupted range, known thus far only from the Rocky Mountains, northern Labrador, and southern Baffin Island. FIG. 51,a,b. MAP 245.

5. **O. hudsonica** (Greene) Fern.—Loosely caespitose with freely branched caudices; viscid-glandular throughout. Leaves 5 to 10 cm. long, with 15 to 33 oblong leaflets, these involute margined, glabrous or sparingly pilose above, sparingly villous beneath. Scapes 10 to 15 cm. long; spike short, 7- to 13-flowered, not elongated in fruit. Flowers fragrant; calyx campanulate, greyish-black hirsute, densely glandular-verrucose, the teeth deltoid, one-quarter to one-third as long as the tube; corolla 1.5 to 1.7 cm. long, purple; legumes thinly grey-pilose, about 2 cm. long, narrowly ovoid, tapering to a long, straight beak.

In not too dry, calcareous sandy and gravelly places.

General distribution: Endemic of the Hudson Bay region and the central Canadian Arctic. FIG. 51,c,d. MAP 246.

6. **O. glutinosa** Porsild—Similar and probably closely related to O. *hudsonica* from which it differs by its much longer, subulate teeth of the calyx and by its inflorescence, which, unlike that of *O. hudsonica,* is considerably elongated in fruit. The foliage of *O. glutinosa,* which is distinctly clammy to the touch because of the presence of numerous glands, is very fragrant when fresh.

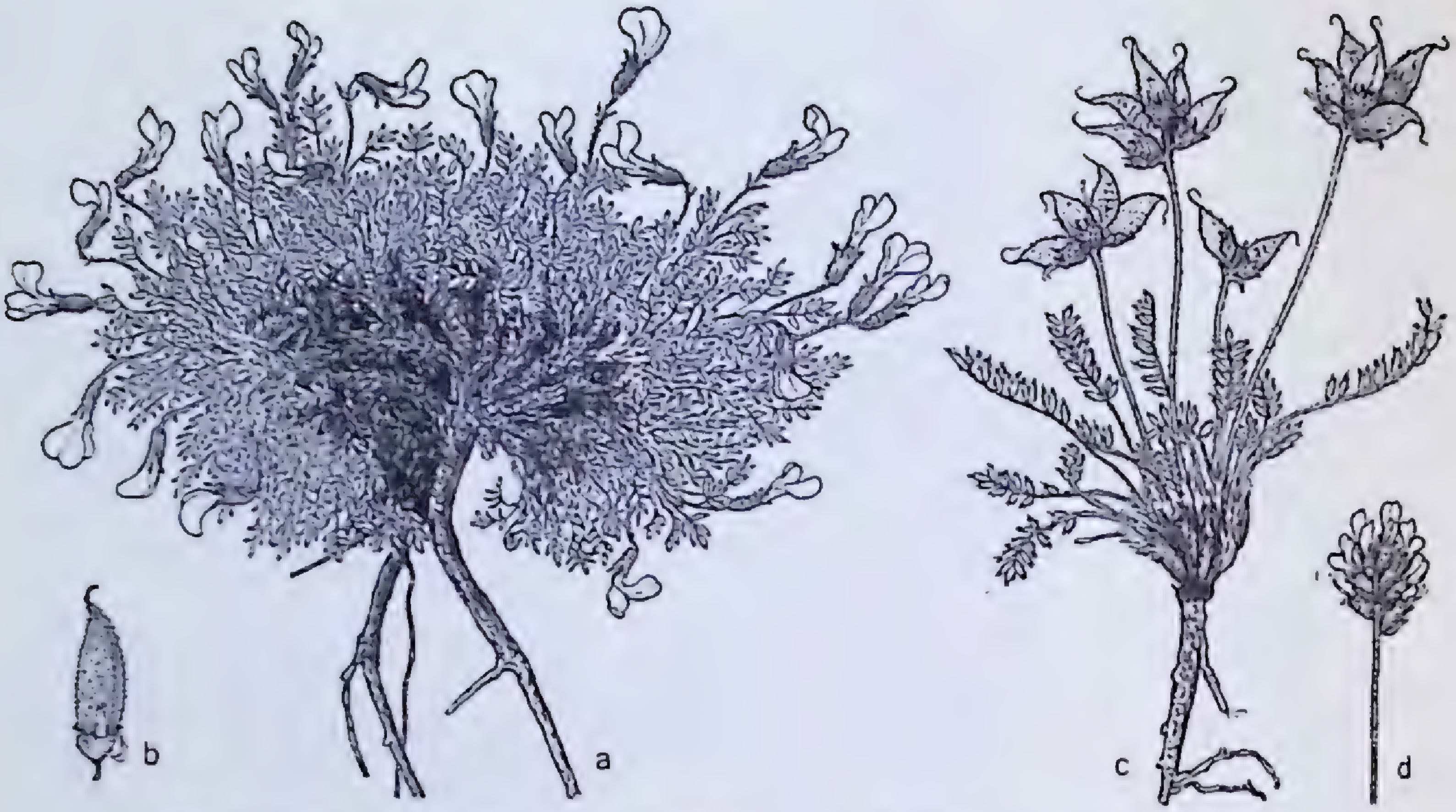

Figure 52. a, b. *Oxytropis arctobia.* c, d. *O. hyperborea.* (1/2)

Calcareous screes and mountain slopes.

General distribution: Endemic of the northern Rocky Mountain region. Fig. 54,a,b. Map 247.

7. **O. hyperborea** Porsild—Caespitose with stout, freely branched caudices. Leaves spreading or ascending, 3 to 12 cm. long, short petioled, and with pale, papery, sparingly villous stipules; leaflets 9 to 19, linear-lanceolate, opposite, sub-opposite, or in fascicles of 3, silky-grey on both sides, or sometimes glabrate above. Scapes 5 to 20 cm. long, erect-ascending, or in the Far North often prostrate; spikes 6- to 10-flowered, subcapitate or lax-flowered, not greatly elongated in fruit. Calyx densely hirsute with mixed short black and long white hairs; the teeth deltoid, one-quarter to one-third as long as the tube. Corolla about 1.5 cm. long, pale yellow or buff in life; legumes ovoid, 1.5 cm. long, including the long beak, villous, with mixed black and white hairs.

Calcareous sandy and gravelly places, and in dry tundra.

General distribution: Endemic to the arctic coast of Yukon, N.W. Mackenzie, and westernmost islands of the Arctic Archipelago. Fig. 52,c,d. Map 248.

8. **O. arctica** R. Br.; *O. coronaminis* Fern.—Densely caespitose, with a stout tap-root and freely branched caudex, often forming soft, cinereous-grey cushions or hassocks 20 to 30 cm. in diameter. Leaves 4 to 6 cm. long with 9 to 13 opposite, oblong-lanceolate leaflets, 9 to 10 mm. long and 3 mm. wide, which are densely white-villose beneath and glabrate above; the rachis and petiole, but especially the base of the stipules, shaggy with long snowy-white or slightly yellowish hairs, the free part papery white, glabrous, with long white hairs along the margins. Scapes 8 to 10 cm. high, erect; spike 3- to 5-flowered, sub-umbellate, not elongating in fruit; flowers sweetly perfumed, very large and showy; calyx about 1.5 cm.

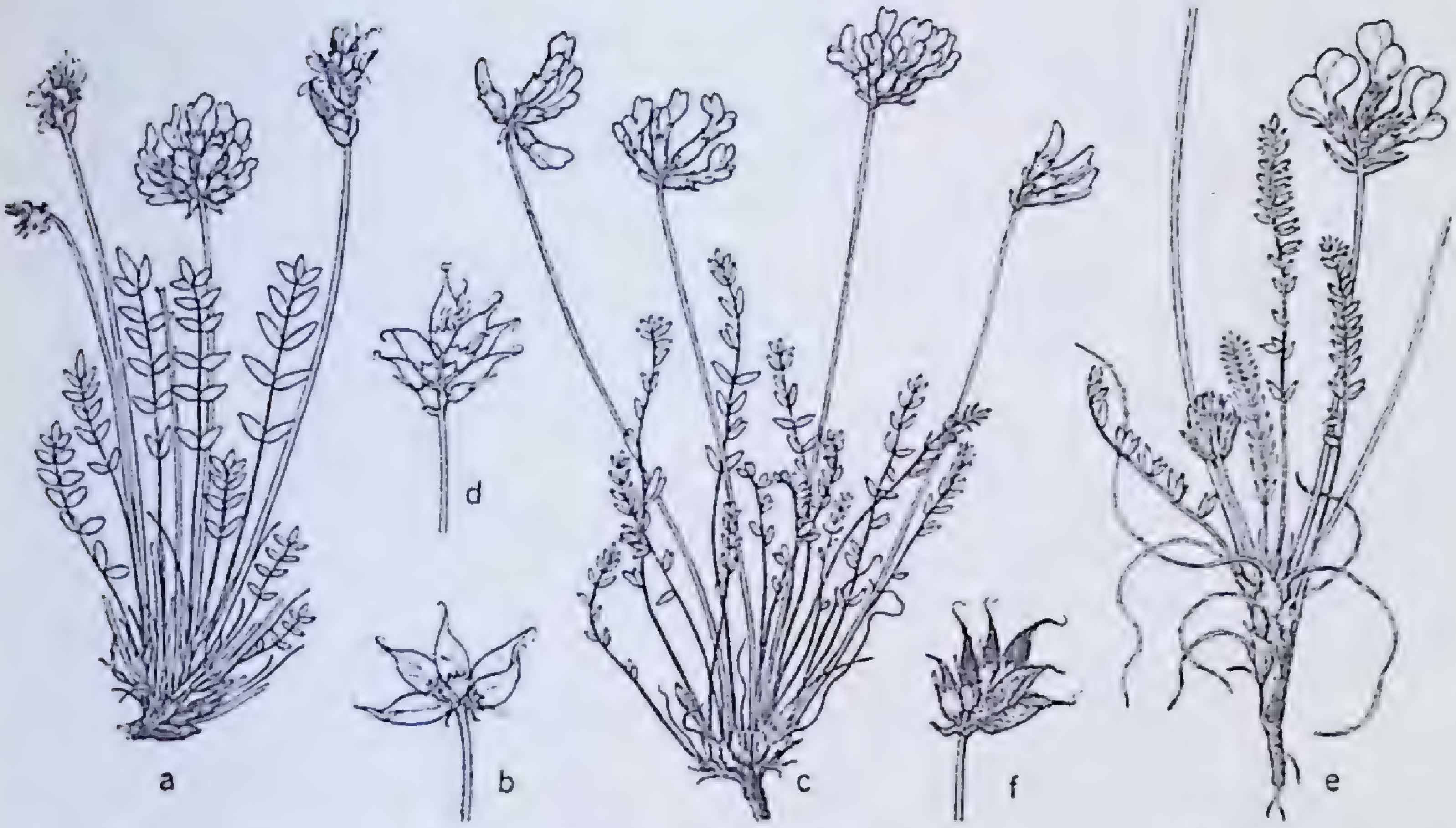

FIGURE 53. a, b. *Oxytropis Maydelliana.* c, d. O. *terrae-novae.* e, f. *O. Bellii.* (2/5)

long, the teeth subulate, one-half as long as the tube; corolla 2.5 cm. long, dark purple, turning blue in drying. Mature legumes dark olive-green pubescent, somewhat sickle-shaped, erect or spreading, 3 cm. long, including the long beak.

Ubiquitous on dry, open tundra and on the flat, windswept calcareous barrens of the westernmost islands of the Archipelago.

General distribution: Endemic to the central Canadian Arctic. FIG. 51, g,h. MAP 249.

9. **O. terrae-novae** Fern.—Loosely caespitose, fresh green, sparingly pubescent or glabrate. Leaves 2 to 9 cm. long, with from 6 to 12 pairs of lanceolate-elliptic, 2 to 8 mm. long and 0.5 to 4 mm. wide, sparingly silky-pubescent or glabrate leaflets, and prominent, membranaceous, sparsely ciliate but otherwise glabrous stipules. Scapes slender, erect-ascending, 5 to 12 cm. long; spikes sub-capitate, 3- to 9-flowered, not elongating. Calyx campanulate, with short, deltoid teeth; corolla purple-violet, about 1.5 cm. long; legumes narrowly ovoid, erect, black-hirsute, about 2.0 cm. long, including the rather short beak.

Turfy, calcareous places, on dry rocky slopes and tundra.

General distribution: Endemic of the eastern Canadian Subarctic. FIG. 53,c,d. MAP 250.

10. **O. Bellii** (Britt.) Palibine—Loosely caespitose with freely branched caudices, forming large, flat cushions up to 30 cm. in diameter. Leaves 3 to 10 cm. long, with 15 to 31 opposite, sub-opposite, or verticillate white villous, somewhat crowded, 3 to 9 mm. long leaflets, and rather small densely villous, pale stipules. Scape reddish brown, 5 to 10 cm. long; spike sub-capitate, 3- to 6-flowered, not elongating in fruit. Calyx wine red in life under the mixed black and white pubescence; the black, subulate teeth,

one-third as long as the tube; corolla about 2.0 cm. long, reddish violet in life, drying violet, with a pale spot on the standard; legumes narrowly ovoid, 2.5 cm. long, including the slender beak.

On dry, gravelly slopes and in rocky tundra. The flowers are faintly fragant.

General distribution: Endemic of the northern Hudson Bay region. FIG. 53,e,f. MAP 251.

4. HEDYSARUM L.

Perennial herbs with odd-pinnate leaves, and showy flowers in axillary, long-peduncled racemes. Legumes linear, thin, flattened, composed of several readily separable, roundish 1-seeded sections or articles.

Calyx teeth deltoid	1. *H. alpinum*
Calyx teeth lance- or linear-subulate	2. *H. Mackenzii*

1. **H. alpinum** L.; LIQUORICE-ROOT—Stems few, erect, 10 to 15, rarely 25 cm. high, from brown, scaly caudices and large, fleshy rootstocks. Leaves fresh green and glabrous, with 9 to 13 lanceolate leaflets, and conspicuous brown stipules. Flowering racemes 3 to 6 cm. long on straight peduncles 5 to 10 cm. long; flowers 10 to 15 pink or pale purple, 1.75 to 2.0 cm. long. Articles of fruit 2 to 3, oval, glabrous, conspicuously net-veined. Our plant appears to be distinct from the more widely distributed var. *americanum* Michx. of more southern range, from which it may be distinguished by its fewer and larger flowers and by its average lower stature.

Calcareous sands and gravels often on river-banks and by sheltered lake shores. The fleshy roots, which in mature plants may be half an inch thick, are edible and when cooked taste somewhat like young carrots. The roots are best in August but may be dug even in spring.

General distribution: Asia and America, arctic-alpine. FIG. 55,a. MAP 252.

2. **H. Mackenzii** Richards.—Stems numerous, ascending or arching, 15 to 25 cm. high, from a much-branched, sub-ligneous caudex, and thick, fibrous tap-root. Leaves silvery grey, with 5 to 13 linear-lanceolate, silky-pubescent leaflets 1.5 cm. long, and inconspicuous, grey stipules. Flowering racemes at first sub-capitate, but soon elongating, 2 to 8 cm. long, on curved, arching peduncles; flowers 5 to 15, deep purple, showy and sweet scented, 2.5 to 3.0 cm. long. Articles of fruit 3 to 6, oval or circular in outline, minutely pubescent and conspicuously transversely veined.

In calcareous clays and gravels, often along river-banks and lake shores.

General distribution: E. Asia and arctic-subarctic N. America. FIG. 54,c,d. MAP 253.

21. LINACEAE Flax Family

1. LINUM L. Flax

Linum Lewisii Pursh—Glabrous perennial herb with several densely leafy stems 15 to 60 cm. tall, from the summit of a sub-ligneous base. Leaves linear, 1 to 2 cm. long, alternate. The large blue, or rarely white, flowers in leafy, often 1-sided racemes; capsules globose, 5-locular, with two large seeds in each locule.

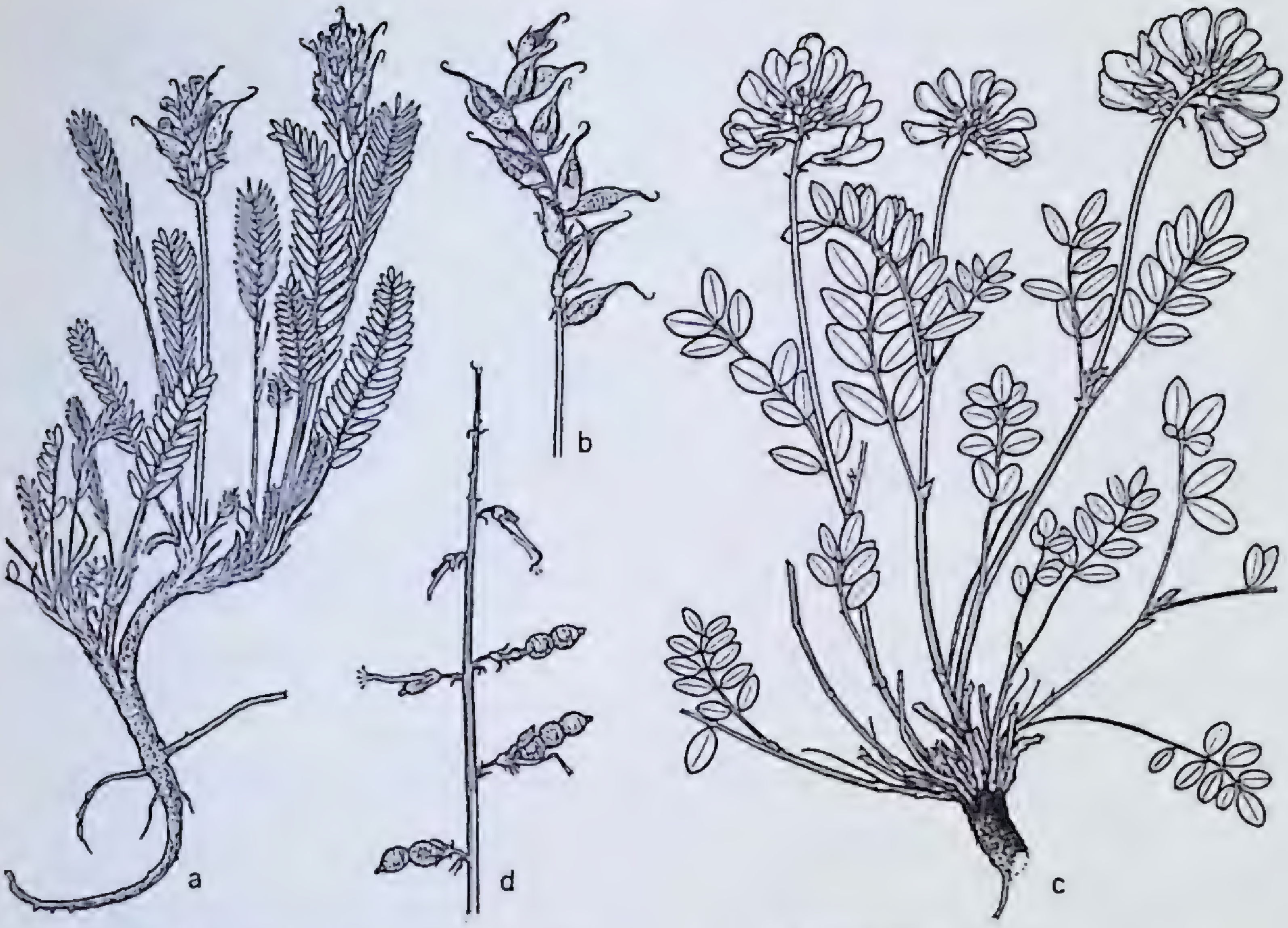

FIGURE 54. a, b. *Oxytropis glutinosa.* c, d. *Hedysarum Mackenzii.* (2/5)

Calcareous, dry, rocky, or gravelly slopes.

General distribution: N. America: prairies and foothills from Ontario to Alaska. FIG. 55,f. MAP 254.

CALLITRICHACEAE Water-Starwort Family

CALLITRICHE L.

Callitriche anceps Fern.—Wholly submersed dwarf aquatic with filiform, angled stems, opposite pale green linear leaves, and solitary, minute axillary flowers. The fruit is nut-like, as long as broad.

Silty bottom of shallow ponds. Greenland, Labrador-Ungava to Newfoundland and the Maritimes, isolated stations in Yukon and Alaska.

C. verna L.—Similar, but distinguished by its greenish-brown and usually obovate or spatulate leaves and by its ellipsoid fruit.

Similar places. Greenland to Alaska; Eurasia.

22. EMPETRACEAE Crowberry Family

1. EMPETRUM L. Crow- or Curlewberry

Empetrum nigrum L.—Depressed and matted, freely branching, evergreen shrub. Leaves linear, spreading, resembling those of spruce or juniper. The inconspicuous, dark purple flowers solitary in the leaf axils, monoecious, dioecious, or in the Arctic generally polygamous (*E. hermaphroditum* Hagerup). The purplish-black, shiny fruits are very juicy and sweet but contain a number of large, hard seeds.

In sandy, rocky, and acid soils; reaching its perfection in a rather moist, maritime climate. The crowberry is a favoured fruit of the Eskimos, who often gather berries in large quantities, even in winter under the snow.

General distribution: Circumpolar, arctic-alpine. Fig. 56,a. Map 255.

VIOLACEAE Violet Family

Viola L.

Viola labradorica Schrank; *V. adunca* Sm. var. *minor* (Hook.) Fern.—Stems elongate, leafy, with pale blue flowers borne from the leaf-axils. Leaves ovate, glabrous with prominent stipules.

Moist cliffs and turfy ledges. S.W. Greenland, Labrador-Ungava south to northern New York, Ontario, Michigan, Great Bear L.

V. pallens (Banks) Brainerd—Stemless, the leaves and peduncles arising directly from the slender, thread-like rhizome. Leaves cordate-ovate; petals white with purple veins.

Moist, turfy places under willows. Labrador-Ungava, west to s. Keewatin, Manitoba south to upland parts of eastern United States.

23. ONAGRACEAE Evening Primrose Family

1. Epilobium L. Willow-herb

Ours perennial, essentially glabrous herbs with alternate or opposite, nearly sessile, entire or sub-entire, lanceolate leaves. Flowers axillary or in terminal, leafy racemes; petals 4, pink, purple, or white. Capsule linear, splitting into four valves; seeds numerous, bearing long, silky tufts of white hairs at their summits.

Coarse plants with alternate leaves and large showy flowers; calyx cleft to the summit of the ovary	
Stems simple, erect, solitary, or few together	1. *E. angustifolium*
Stems numerous, tufted, depressed, or ascending, often branched	2. *E. latifolium*
Dwarf plants with mostly opposite leaves and few, small flowers; calyx with a short tube	
Flowering stems stiffly erect from a basal rosette of round-tipped leaves; flowers white	3. *E. arcticum*
Flowering stems S-shaped; flowers pink	4. *E. anagallidifolium*

1. **E. angustifolium** L; Fireweed—Stems 15 to 80 cm. tall and leafy; the leaves membranaceous, green, veiny beneath. Raceme many-flowered, elongated; flowers rose-pink, rarely white.

Occasional in willow thickets and on south-facing screes.

General distribution: Circumboreal-alpine, but not arctic; in our area represented by the northern var. *intermedium* (Wormskj.) Fern. Fig. 55,e. Map 256.

2. **E. latifolium** L.; Broad-leaved Willow-herb—Stems usually lower, from 15 to 40 cm. tall, with dark green, glaucous or purplish fleshy leaves. Racemes few-flowered; flowers purple or rarely white, very large and showy.

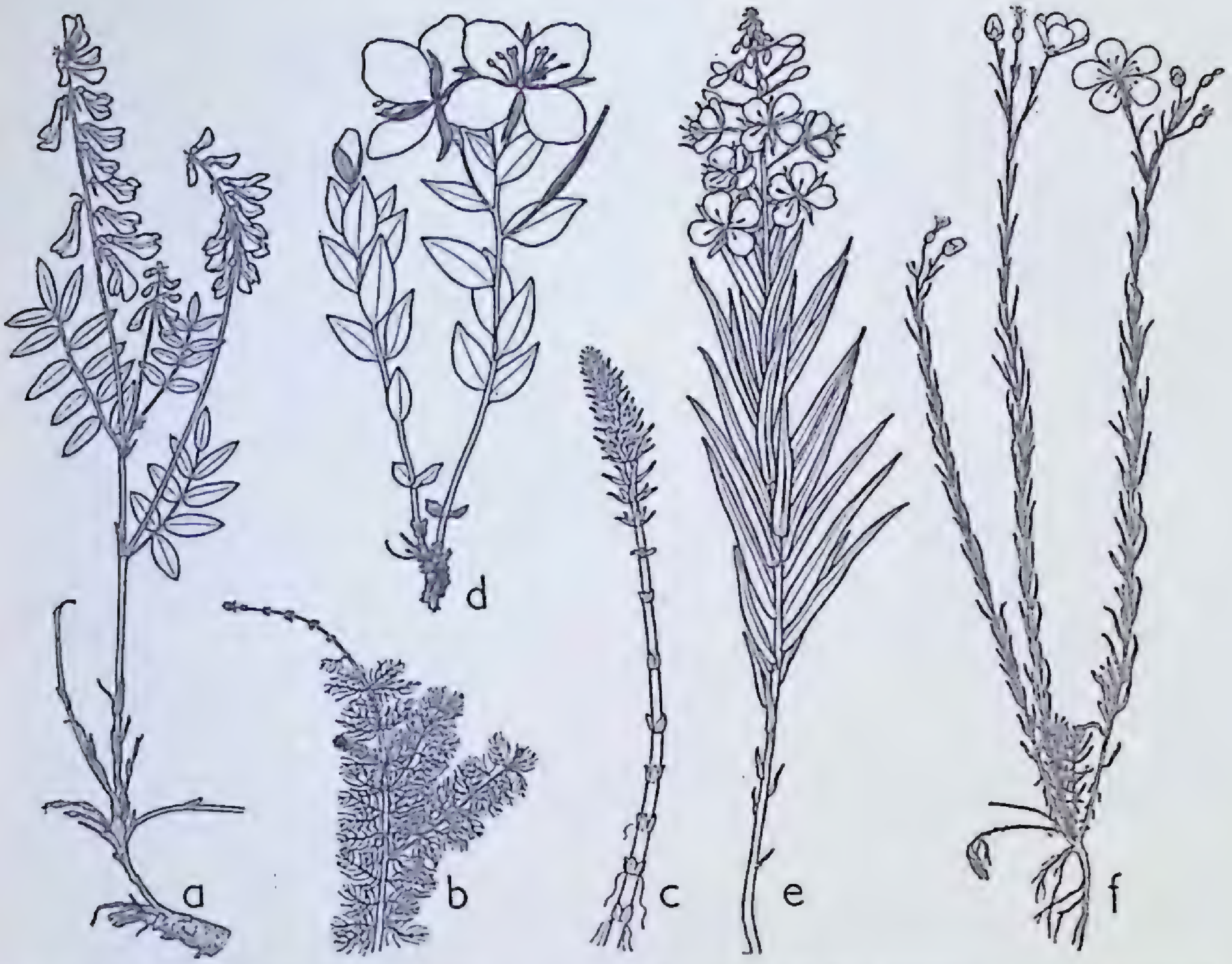

FIGURE 55. a. *Hedysarum alpinum.* b. *Myriophyllum exalbescens.* c. *Hippuris vulgaris.* d. *Epilobium latifolium.* e. *E. angustifolium* var. *intermedium.* f. *Linum Lewisii.* (1/3)

The flowers of the willow-herb may be eaten raw as a salad, and the fleshy leaves are edible when cooked. In Greenland, the young leaves and the flowers are occasionally eaten raw with seal blubber.

Common or even abundant throughout the Arctic in sandy and gravelly, well-watered soils, such as gravel bars or flood plains.

General distribution: Circumpolar arctic-alpine. FIG. 55,d. MAP 257.

3. **E. arcticum** Samuelss.; *E. davuricum* Fisch. var. *arcticum* (Samuelss.) Polunin—Stems dark green or purple, tufted or few together, 6 to 12 cm. tall, stiff and mostly simple, bearing 2 to 3 pairs of narrowly oblong, repand-dentate leaves. Capsules stiffly erect. Seeds papillose (when seen under a strong lens).

Rare, in wet clay in tundra barrens.

General distribution: Amphi-Atlantic, arctic. FIG. 56,b. MAP 258.

4. **E. anagallidifolium** Lam.—Dark green or reddish-tinged plant with weak, curved or S-shaped, 10 to 20 cm. tall stems, bearing several pairs of ovate or oblanceolate, entire, or repand-dentate leaves. Capsules more or less nodding, even at maturity. Seeds smooth.

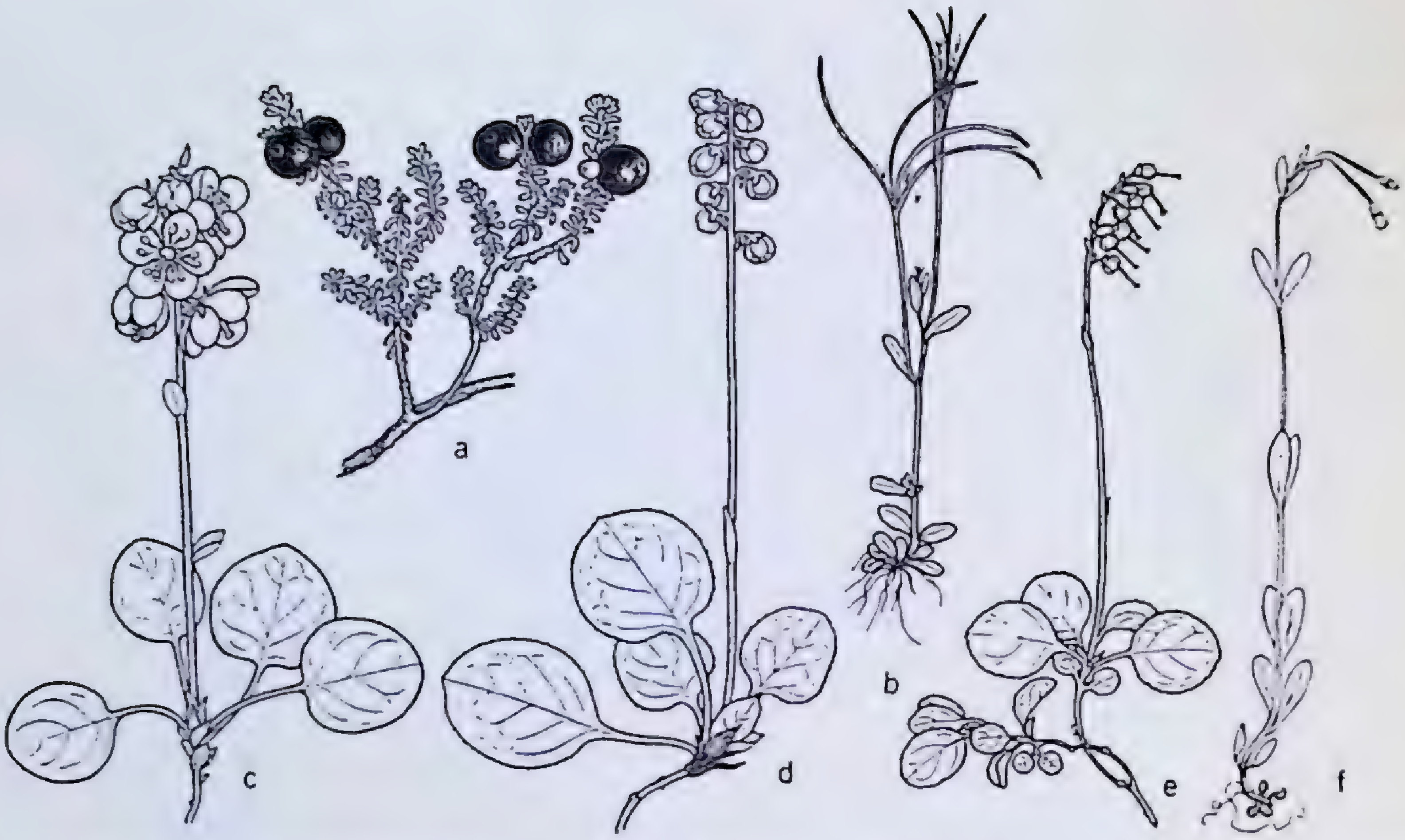

FIGURE 56. a. *Empetrum nigrum.* b. *Epilobium arcticum.* c. *Pyrola grandiflora.* d. *P. minor.* e. *P. secunda* var. *obtusata.* f. *Epilobium anagallidifolium.* (1/2)

In wet moss by alpine brooks.

General distribution: Circumpolar (with several large gaps), subarctic-alpine. From our area, doubtfully reported from southern Baffin Island, where future collecting may well confirm its presence. FIG. 56,f. MAP 259.

E. palustre L.—Stems 10 to 20 cm. high, stiffly erect, bearing 5 to 6 pairs of entire, linear-oblong-lanceolate, glabrous leaves; petals deeply notched, pale reddish-violet. Innovations by filiform stolons terminating in tiny, scaly winter buds.

Mossy edges of ponds and bogs. Circumboreal.

24. HALORAGACEAE Water-Milfoil Family

MYRIOPHYLLUM L. Water-Milfoil

M. exalbescens Fern.—Perennial, submersed aquatic with flaccid, simple, or branched stems bearing whorled leaves pinnately divided into capillary divisions. Inflorescence spike-like, usually emerging above water. The flowers small and inconspicuous, 4-merous, sessile in the axils of the much reduced upper-leaves.

Shallow, calcareous ponds or sluggish streams.

General distribution: N. America, boreal-subarctic. In our area, known from a single collection on the west coast of Baffin Island. FIG. 55,b. MAP 260.

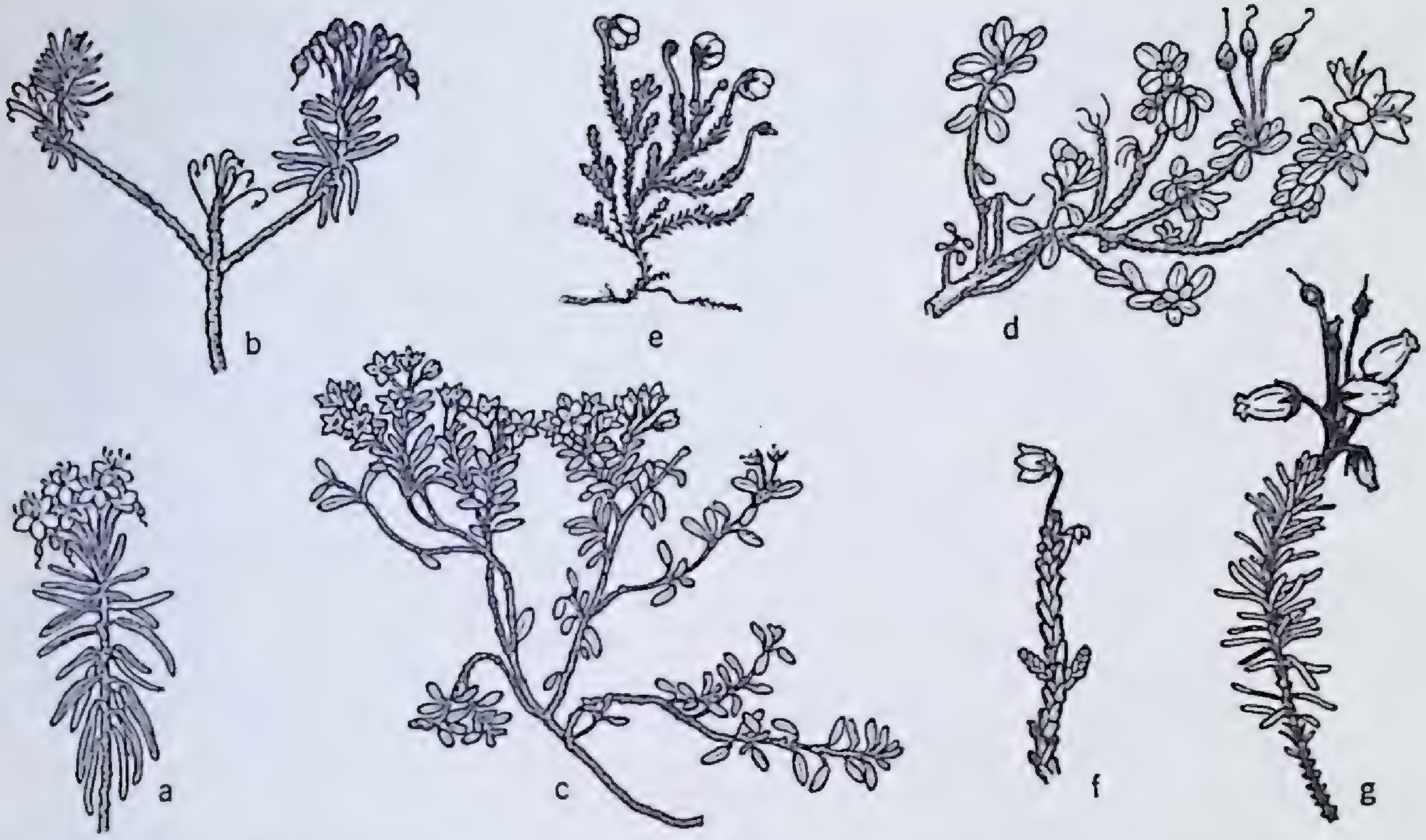

FIGURE 57. a, b. *Ledum decumbens.* c. *Loiseleuria procumbens.* d. *Rhododendron lapponicum.* e. *Cassiope hypnoides.* f. *C. tetragona.* g. *Phyllodoce coerulea.* (1/2)

25. HIPPURIDACEAE Mare's-Tail Family

HIPPURIS L. Mare's-Tail

H. vulgaris L.—Perennial submersed or emergent aquatic with a stout, creeping rootstock, from which rise simple, leafy shoots. Leaves linear, 0.5 to 1.0 cm. long, arranged in whorls of 4 to 10. Small, inconspicuous flowers in the axils of the uppermost leaves.

In shallow ponds and small lakes.

General distribution: Circumpolar, low-arctic. FIG. 55,c. MAP 261.

26. PYROLACEAE Wintergreen Family

1. PYROLA L. Wintergreen

Perennial herbs, ours with creeping, slender rootstocks and simple, petioled, wintergreen leaves and racemose flowers with 5 sepals, 5 petals, and 8 to 10 stamens. Capsule with numerous small seeds.

Raceme 1-sided	1. *P. secunda* var. *obtusata*
Raceme cylindrical	2. *P. grandiflora*

1. **P. secunda** L. var. **obtusata** Turcz.; NODDING WINTERGREEN—Stems slender, 5 to 20 cm. high, with scattered leaves in the lower half; leaves short-petioled, the blade ovate-orbicular, fresh green, and somewhat leathery, with crenulate-serrate margins. Inflorescence of small, whitish-green flowers.

Rare in well-sheltered, mossy places.

General distribution: Circumpolar, subarctic. In our area thus far known only from Victoria Island. FIG. 56,e. MAP 262.

2. **P. grandiflora** Rad.; LARGE-FLOWERED WINTERGREEN—Stems 10 to 25 cm. high; leaves all basal, long-petioled, the blade circular in outline, dark green, leathery and lustrous above with distinctly rolled margins. Flowers 2.0 to 2.5 cm. in diameter, creamy white or tinged with pink, perfumed, with a long, deflexed, and protruding style.

Common on sheltered, sunny slopes.

General distribution: Circumpolar, arctic. FIG. 56,c. MAP 263.

P. minor L.—Similar, but smaller, with oblong, dark green, dull leaves with flat, crenulated margins. Inflorescence of small, scentless, globular, pink or white flowers in a spike-like raceme. The short, straight style is barely exserted.

In sheltered, mossy places. Doubtfully recorded from our area where it is not likely to occur except in the southernmost parts.

General distribution: Circumpolar, subarctic-alpine. FIG. 56,d. MAP 264.

27. ERICACEAE Heath Family

Dwarf shrubs with evergreen or deciduous leaves and regular, 5-merous flowers. Fruit a dehiscing capsule, or a berry.

Ovary superior	
Fruit a dehiscing capsule; leaves evergreen	
Corolla free; leaves linear-oblong, rusty beneath	1. LEDUM
Corolla united	
Stamens 5, corolla pink	2. LOISELEURIA
Stamens 10	
Stamens 2-awned; flowers solitary, white	3. CASSIOPE
Stamens awnless; flowers in clusters, purple	
Corolla urceolate	4. PHYLLODOCE
Corolla open	5. RHODODENDRON
Fruit a berry-like fleshy drupe	6. ARCTOSTAPHYLOS
Ovary inferior; fruit a berry	7. VACCINIUM

1. LEDUM L.

L. decumbens (Ait.) Lodd.; LABRADOR TEA—Aromatic, much branched, decumbent or ascending dwarf shrub with dark green, linear, and strongly revolute leathery leaves, and small, white, spicy flowers arranged in terminal umbels. The underside of the leaves, the young twigs, and the sharply bent pedicels covered with rust-coloured, matted hairs.

Common in not too wet dwarf shrub- or moss-lichen heath or on sunny cliffs and ledges.

General distribution: E. Asia, Alaska to W. Greenland; Arctic. FIG. 57,a,b. MAP 265.

2. LOISELEURIA Desv.

L. procumbens (L.) Desv.; ALPINE AZALEA—Depressed, much branched, tufted dwarf shrub with minute, leathery, elliptic, and glabrous leaves and few-flowered clusters of small pink or white flowers.

Occasional to common in dry, stony heath on acid, Precambrian rocks.

General distribution: Circumpolar, arctic-alpine. FIG. 57,c. MAP 266.

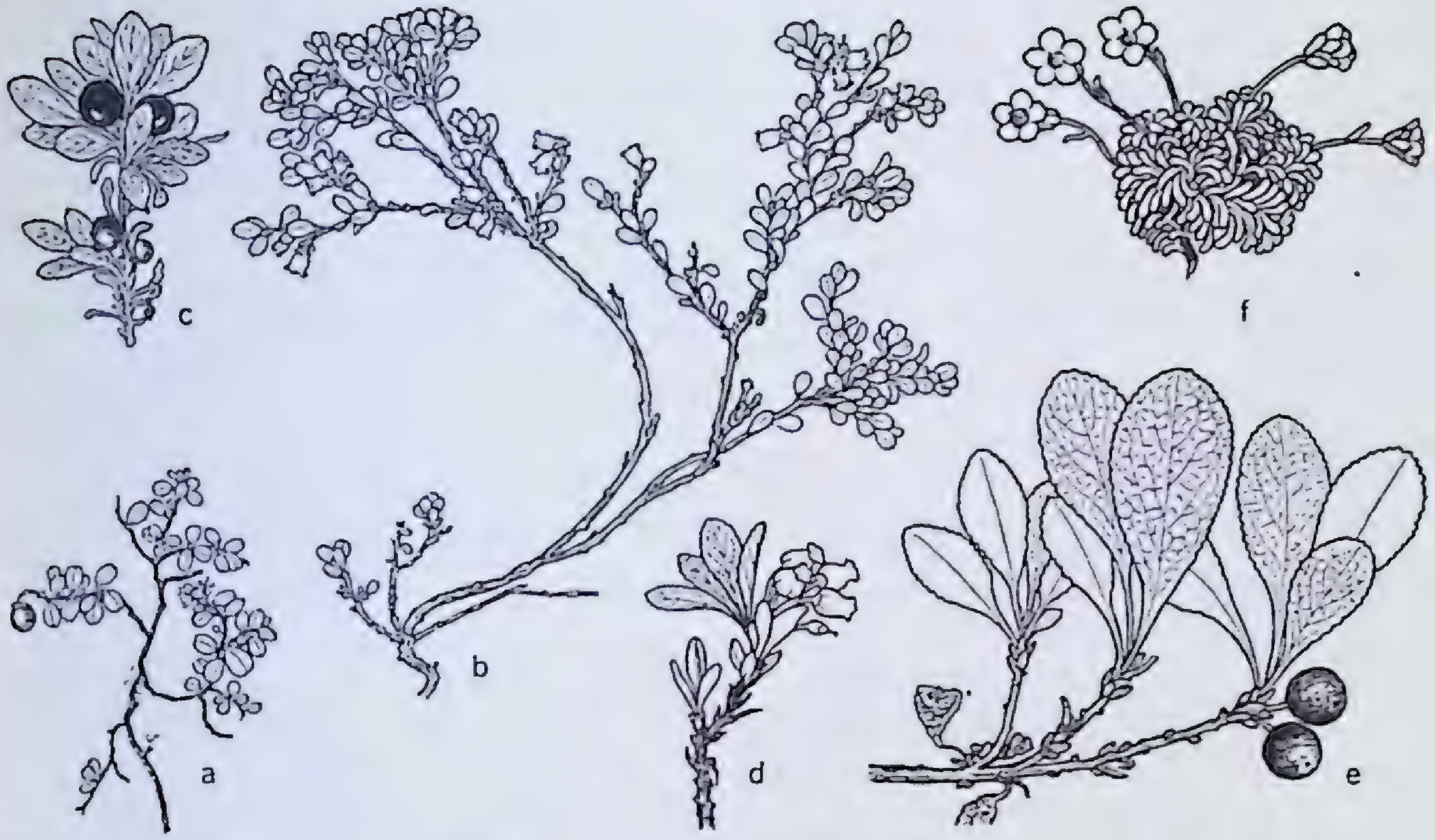

FIGURE 58. a. *Vaccinium Vitis-idaea* var. *minus*. b. *V. uliginosum* var. *alpinum*. c, d. *Arctostaphylos alpina*. e. *A. rubra*. f. *Diapensia lapponica*. (1/2)

3. CASSIOPE D.Don. White Heather

Dwarf shrubs with imbricated, scale-like evergreen leaves and solitary white, nodding flowers on slender peduncles appearing in the leaf axils toward the tip of the branches.

1. **C. hypnoides** (L.) D. Don; MOSS HEATHER—Moss-like, with tufted, procumbent stems and loosely imbricated soft, needle-like leaves, and small, bell-shaped flowers on soft-pubescent capillary peduncles; corolla white, the calyx wine-red.

In sheltered, rocky places, especially on snowbeds along brooks and lake shores, where the snow remains until late into the summer.

General distribution: Amphi-Atlantic, subarctic-alpine. FIG. 57,e. MAP 267.

2. **C. tetragona** (L.) D. Don; ARCTIC WHITE-HEATHER—A coarse, heath-forming dwarf shrub with imbricated, dark green, leathery leaves arranged in four rows, on the stiff, quadrangular branches. The faintly perfumed flowers are larger than in the preceding, the calyx yellowish-green and the peduncles glabrous.

A dominant or even ubiquitous arctic species in not too dry tundra, but in the Arctic Archipelago often restricted to places where some snow accumulates in winter. Because of its local abundance, it is important to the Eskimos and to travellers as a source of fuel for outdoor cooking. Owing to its content of resin, the plant burns with a hot flame when dry.

General distribution: Circumpolar, arctic. FIG. 57,f. MAP 268.

4. Phyllodoce Salisb.

P. coerulea (L.) Bab.—Low, heath-like, much-branched shrub with crowded, linear, somewhat serrulate evergreen leaves. The purple, urceolate flowers, on slender, reddish-glandular pedicels, in terminal, few-flowered clusters.

In turfy, rocky places where the snow remains late.

General distribution: Circumpolar, subarctic-alpine. Fig. 57,g. Map 269.

5. Rhododendron L.

R. lapponicum (L.) Wahlenb.; Lapland Rosebay—Depressed, matted, or erect, much-branched, dwarf shrub with scurfy twigs and elliptic-oblanceolate leaves 1 to 2 cm. long, that are scurfy beneath. The showy, deep purple, very aromatic flowers, 1 to 2 cm. broad, in few-flowered terminal clusters.

In dry, rocky tundra and on stony slopes.

General distribution: Circumpolar, in N. America wide-ranging, arctic. Fig. 57,d. Map 270.

6. Arctostaphylos Adans. Bear Berry

Leaves persisting for several years; fruit black	1. *A. alpina*
Leaves soon falling; fruit red	2. *A. rubra*

1. **A. alpina** (L.) Spreng.; Alpine Bear Berry—Matted, trailing shrub with shreddy bark and subcoriaceous, long-persisting obovate or oblanceolate, rugose, crenulate leaves that turn a deep red in autumn. The small, yellowish-green, urceolate flowers appear in small clusters toward the end of the branches in early spring before the leaves unfold. The edible but rather insipid fruits are black and shiny when ripe.

Occasional in acid rocky and gravelly places and in rocky tundra.

General distribution: Circumpolar, subarctic. Fig. 58,c,d. Map 271.

2. **A. rubra** (Rehd. & Wils.) Fern.—Similar, but leaves readily deciduous and not deeply wrinkled. Fruits scarlet and very juicy but rather insipid.

Calcareous gravels and rocky tundra.

General distribution: E. Asia and N. America, subarctic. Fig. 58,e. Map 272.

7. Vaccinium L.

Leaves deciduous; sweet, blue or black berries	1. *V. uliginosum*
Leaves evergreen; acid, red, shiny berries	2. *V. Vitis-idaea*

1. **V. uliginosum** L.; Bilberry—Low, much-branched, depressed or erect shrub with small, oval, deciduous leaves that are dull green above and glaucous beneath. Flowers small, urceolate, pale pink, in the leaf axils. The edible, sweet berries ripen in August.

Common in acid soil and in dry as well as moist places; in the southern part of its range usually producing an abundance of sweet, delicious berries. In our area represented by the arctic-alpine var. *alpinum* Big.

General distribution: *V. uliginosum* s. lat.: Circumpolar, arctic. Fig. 58,b. Map 273.

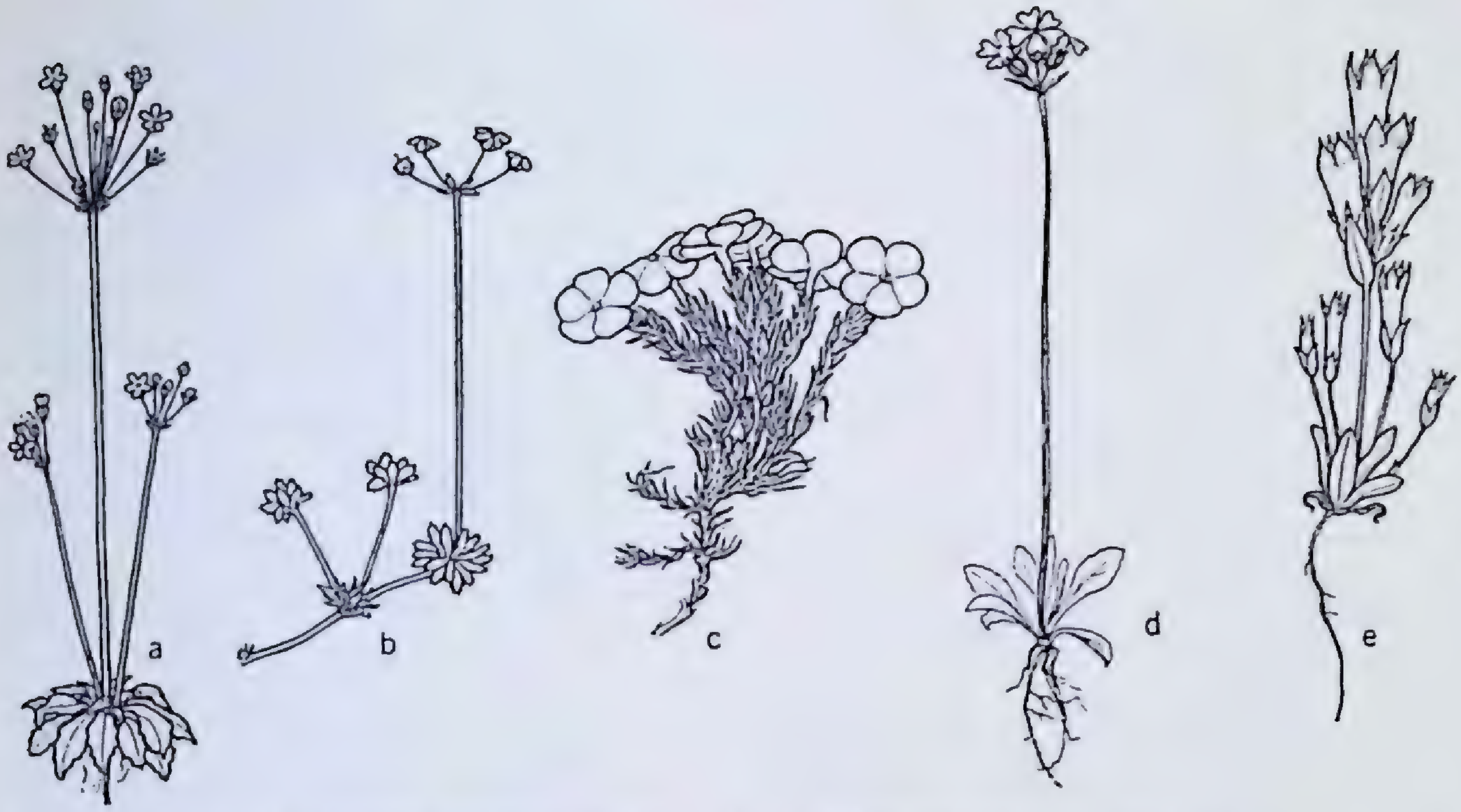

FIGURE 59. a. *Androsace septentrionalis.* b. *A. Chamaejasme* var. *arctica.* c. *Phlox Richardsonii.* d. *Primula stricta.* e. *Gentiana arctophila.* (1/2)

2. **V. Vitis-idaea** L. var. **minus** Lodd.; MOUNTAIN CRANBERRY—Low, creeping shrub with lustrous, leathery leaves. The white or pink bell-shaped flowers in small, nodding, terminal clusters. The shiny, dark red, acid berries ripen in August or September but remain on the vines throughout the winter, and the following spring, when the snow disappears, are even more palatable than in the autumn.

In acid, turfy, dry or moist places, in the southern parts of our area where fruits ripen only in exceptionally warm summers.

General distribution: Circumpolar, subarctic. FIG. 58,a. MAP 274.

28. DIAPENSIACEAE Diapensia Family

DIAPENSIA L.

D. lapponica L.—Perennial dwarf shrub forming firm hemispherical tussocks. Stems with densely imbricated, evergreen, yellowish-green, usually curved, narrowly spatulate leaves 1 to 2 cm. long. Flowers solitary, 5-merous regular, on stiff peduncles. Calyx yellowish-green; the 1 to 1.5 cm. broad corolla white. Capsule enclosed, containing a few, large seeds.

On rocky ledges and in gravelly places.

General distribution: Amphi-Atlantic, arctic-alpine. Fig. 58,f. MAP 275.

29. PRIMULACEAE Primrose Family

Herbs with simple leaves and regular, perfect, gamopetalous flowers with stamens inserted in the corolla tube; ovary superior, 1-celled. Fruit a capsule, in ours opening from the top with 5 valves.

Corolla-tube longer than the calyx	1. PRIMULA
Corolla-tube shorter than the calyx	2. ANDROSACE

1. PRIMULA L. Primrose

P. stricta Hornem.—Low, glabrous perennial with tufted, basal, oblanceolate to narrowly obovate green leaves and simple slender, stiffly erect, 5 to 30 cm. high scapes, terminating in 3- to 8-flowered umbels of small lilac flowers.

Rare and local in wet saline meadows and along seashores.

General distribution: Arctic and subarctic N. America, extending into arctic E. Asia and W. Europe. FIG. 59,d. MAP 276.

P. borealis Duby—Leaves petiolate with a broadly dilated blade; scapes 5 to 10 cm. high, terminating in an umbel of large and very showy lilac flowers.

In moist, grassy seashore meadows. Arctic coast of Alaska to Mackenzie. E. Asia.

2. ANDROSACE L.

Annual or biennial; scapes glabrous	1. *A. septentrionalis*
Perennial; scapes villous	2. *A. Chamaejasme* var. *arctica*

1. **A. septentrionalis** L. s.lat.—Small tufted plants with a rosette of sessile, entire or toothed, glabrous or sparingly stellate pubescent, linear-lanceolate or oblanceolate and often reddish leaves; scapes few to many from each rosette, 5 to 30 cm. high, and often unequal, erect or ascending, terminating in few- to many-flowered umbels of small, white flowers.

A polymorphic species growing in not too dry, calcareous, sandy or gravelly places.

General distribution: Circumpolar, arctic-alpine. FIG. 59,a. MAP 277.

2. **A. Chamaejasme** Host. var. **arctica** R. Knuth; ROCK-JASMINE—Loosely caespitose, with stolons terminating in globular rosettes of imbricated, broadly ovate leaves, 5 to 10 mm. long, loosely covered on both sides by shaggy, white or yellowish hairs. Scapes 2 to 15 cm. high, villous, terminating in few-flowered umbels of very fragrant flowers. Corolla 8 to 10 mm. in diameter, creamy white with a yellow throat, turning pink in age.

Calcareous sand and gravel.

General distribution: E. Asia and N.W. America; arctic-alpine. FIG. 59,b. MAP 278.

30. PLUMBAGINACEAE Leadwort Family

ARMERIA Willd. Thrift

A. maritima (Mill.) Willd. ssp. **labradorica** (Wallr.) Hult.—Densely tufted herbs with marcescent, greyish-green, linear, somewhat fleshy leaves, and one to several scapes, 5 to 30 cm. tall, terminating in a hemispherical head of small, pink flowers. Calyx 6 to 7 mm. long, dry and scarious with funnel-formed limb and pointed lobes, the tube densely pilose on the 10 ribs, as well as in the grooves between. Petals rose pink. Fruit indehiscent within the persistent calyx.

Gravelly tundra, flood-plains and lake shores. A western race, ssp. *arctica* (Cham.) Hult., in which the grooves between the ribs of the calyx tube are glabrous (FIG. 60,g.), may occur in the westernmost islands of the Archipelago.

General distribution: Amphi-Atlantic, arctic. FIG. 60,e,f (ssp. *labradorica*); g (ssp. *arctica*). MAP 279.

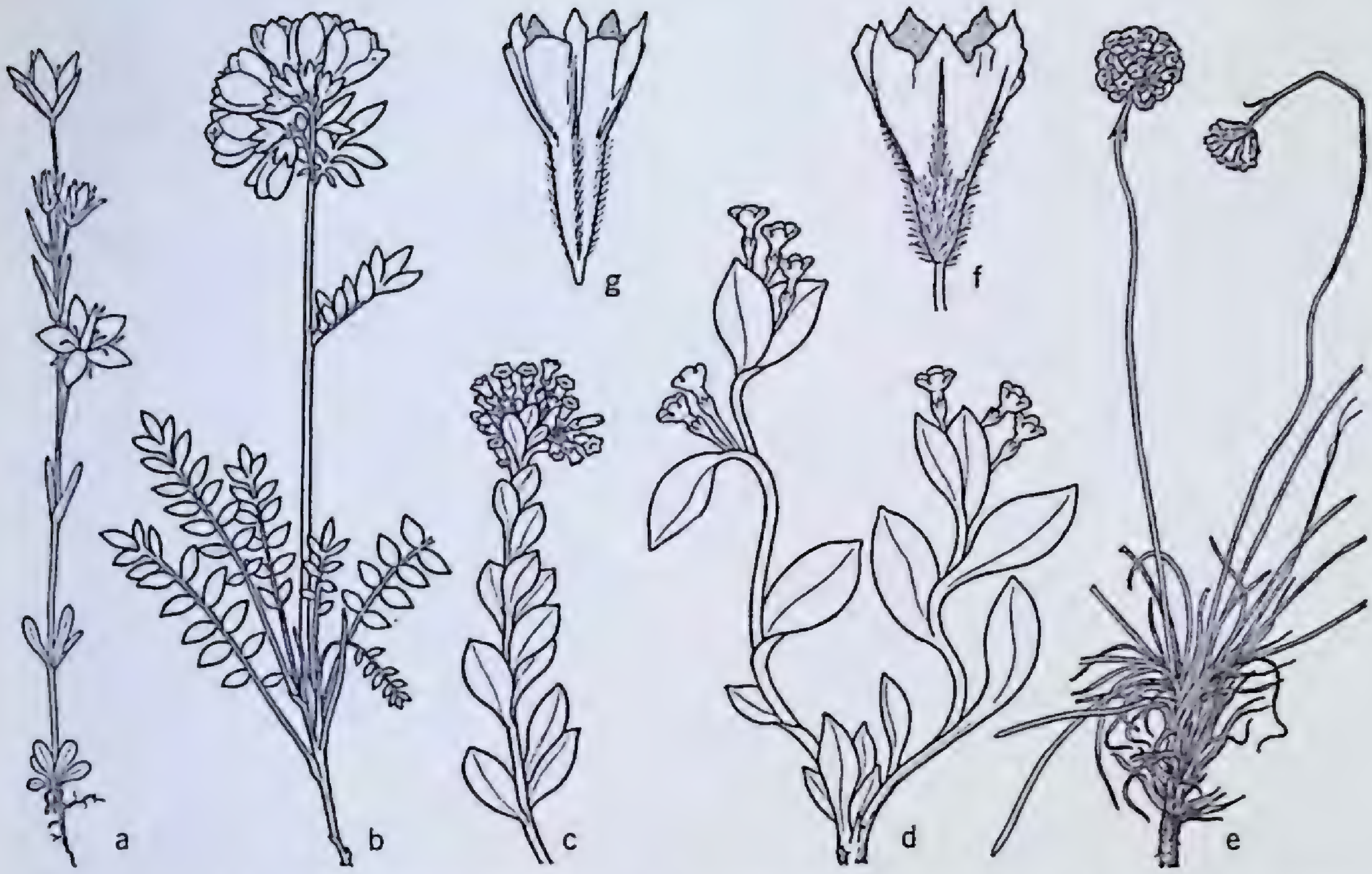

Figure 60. a. *Lomatogonium rotatum.* b. *Polemonium boreale.* c. *Mertensia maritima.* d. *M. Drummondii* (after Williams, 1940, pl. 30). e, f. *Armeria maritima* ssp. *labradorica.* g. *A. maritima* ssp. *arctica.* (2/5; d 1/2; f, g 3/1)

31. GENTIANACEAE Gentian Family

Glabrous herbs with acrid, watery juice, opposite leaves, regular 4- to 5-merous flowers and 2-valved capsule, containing many small seeds.

Corolla funnel-shaped	1. Gentiana
Corolla rotate	2. Lomatogonium

1. Gentiana L. Gentian

G. arctophila Griseb.—Dwarf annual or biennial from a small rosette of obovate, sessile leaves; stems one to several, the central 5 to 15 cm. tall, one- to several-flowered, the lateral weaker and usually arched and one-flowered. Central flower largest; corolla 15 to 25 mm. long, deep blue, its lobes triangular-ovate, cuspidate.

Dry, sunny slopes and herbmats.

General distribution: Endemic of N.W. America; arctic-alpine. Fig. 59,e. Map 280.

G. propinqua Richards.—Similar, but stems 10 to 25 cm. tall, often with slender, small-flowered branches from the axils of the lower leaves.

Dry, sunny slopes and herbmats. Southern Ungava, Newfoundland, Hudson Bay, Alberta, British Columbia, Yukon and Alaska, N.E. Asia.

G. nivalis L.—Stems stiffly erect, simple or slightly branched, 5 to 10 cm. high. Corolla deep sky-blue.

Herbmats and sunny slopes. Southern E. and W. Greenland, Labrador, Scandinavia, and mts. of Central Europe; Asia Minor.

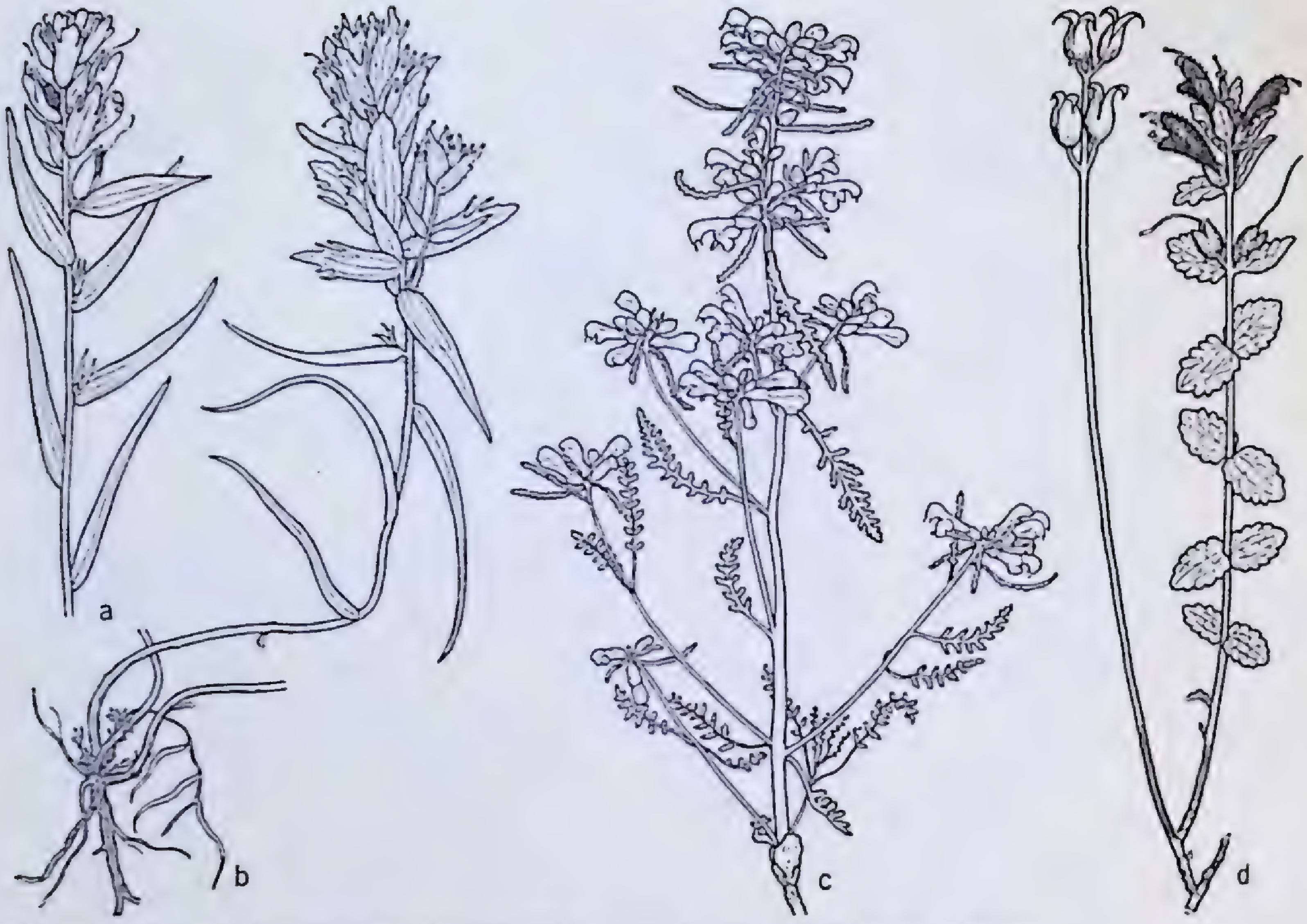

Figure 61. a. *Castilleja septentrionalis.* b. *C. pallida* ssp. *elegans.* c. *Pedicularis labradorica.* d. *Bartsia alpina.* (2/5)

2. Lomatogonium A.Br.

L. rotatum (L.) Fries—Small, purplish-green annual or biennial with simple or branched stems 5 to 20 cm. high, with straight, ascending, slender branches. Basal leaves spatulate-lanceolate, soon withering, stem leaves linear-lanceolate or oblong. Sepals like the upper stem-leaves; the expanded corolla rotate, purplish-blue, or rarely white.

Saline moist turfy or sandy places by the seashore or by saline lake shores or springs.

General distribution: Circumpolar, subarctic. Fig. 60,a. Map 281.

32. POLEMONIACEAE Polemonium Family

Herbaceous or suffrutescent plants with alternate or opposite leaves, regular 5-merous flowers and 3-valved, 3-locular, few-seeded capsules.

Leaves alternate, pinnate	1. Polemonium
Leaves opposite, entire	2. Phlox

1. Polemonium L. Jacob's Ladder

P. boreale Adams—Low, loosely tufted, somewhat viscid-pubescent perennial with a branched rootstock. Leaves with 8 to 12 pairs of elliptic leaflets 0.5 cm. long; stems 10 to 15 cm. high, simple or branched, sparingly leafy below. The large purplish-blue flowers in a dense corymb.

Calcareous, sandy or gravelly places, often near animal burrows.

General distribution: Circumpolar (with several large gaps), high-arctic. Fig. 60,b. Map 282.

2. Phlox

Ph. Richardsonii Hook.; Richardson's Phlox—Loosely tufted, low perennial from a much-branched, sub-ligneous base. Stems decumbent or ascending, simple or branched, with imbricated, awl-shaped, somewhat hairy leaves 1 cm. long, each branch terminating in a sessile, pale lavender or white, very fragrant flower. Corolla with a long tube and flat, rotate limb about 1 cm. in diameter.

Windswept, sandy or gravelly hilltops or barrens.

General distribution: A rare endemic thus far known only from a few stations in northwest Alaska, Yukon, the arctic coast of Mackenzie, and from Banks Island. Fig. 59,c. Map 283.

33. BORAGINACEAE Borage Family

Mertensia Roth Lungwort

Perennial herbs with fleshy, glabrous, entire leaves, ascending or decumbent, mostly simple and leafy stems and open, cymose inflorescences of small, campanulate, pale purplish-blue (or rarely white) flowers. Fruit of 4 nutlets.

1. **M. maritima** (L.) F. J. Gray; Sea-Lungwort—Spreading, decumbent seashore plant with smooth, glaucous ovate or spatulate leaves, and small purplish pink, pale blue or rarely white flowers. Nutlets smooth under the spongy outer coat which becomes inflated thereby making them adaptable to dispersal by sea.

Occasional to common on gravelly or shingly sea-beaches.

General distribution: Circumpolar, wide-ranging. Fig. 60,c. Map 284.

2. **M. Drummondii** (Lehm.) G. Don; Drummond's L.—Similar, but with erect-ascending stems, 7 to 15 cm. high, from a stout, fusiform base. Leaves fresh green, strigillose above, glabrous below.

General distribution: A very rare plant, endemic to the arctic coast of Mackenzie District and Victoria Island, but not a seashore species. Fig. 60,d. Map 285.

34. SCROPHULARIACEAE Figwort Family

Ours chiefly perennial herbs with opposite or alternate leaves and axillary, racemose, or spicate inflorescence of mostly irregular flowers, and 2-locular, many-seeded capsules; with the exception of *Veronica*, partly parasitic on the roots of other plants.

Leaves opposite	
Annual	3. Euphrasia
Perennial	
Corolla distinctly 2-lipped	4. Bartsia
Corolla rotate, 4-cleft	1. Veronica
Leaves alternate	
Leaves pinnate, chiefly in a basal rosette; floral bracts not coloured	5. Pedicularis
Leaves irregularly cut-lobed, not rosulate; floral bracts petaloid, coloured	2. Castilleja

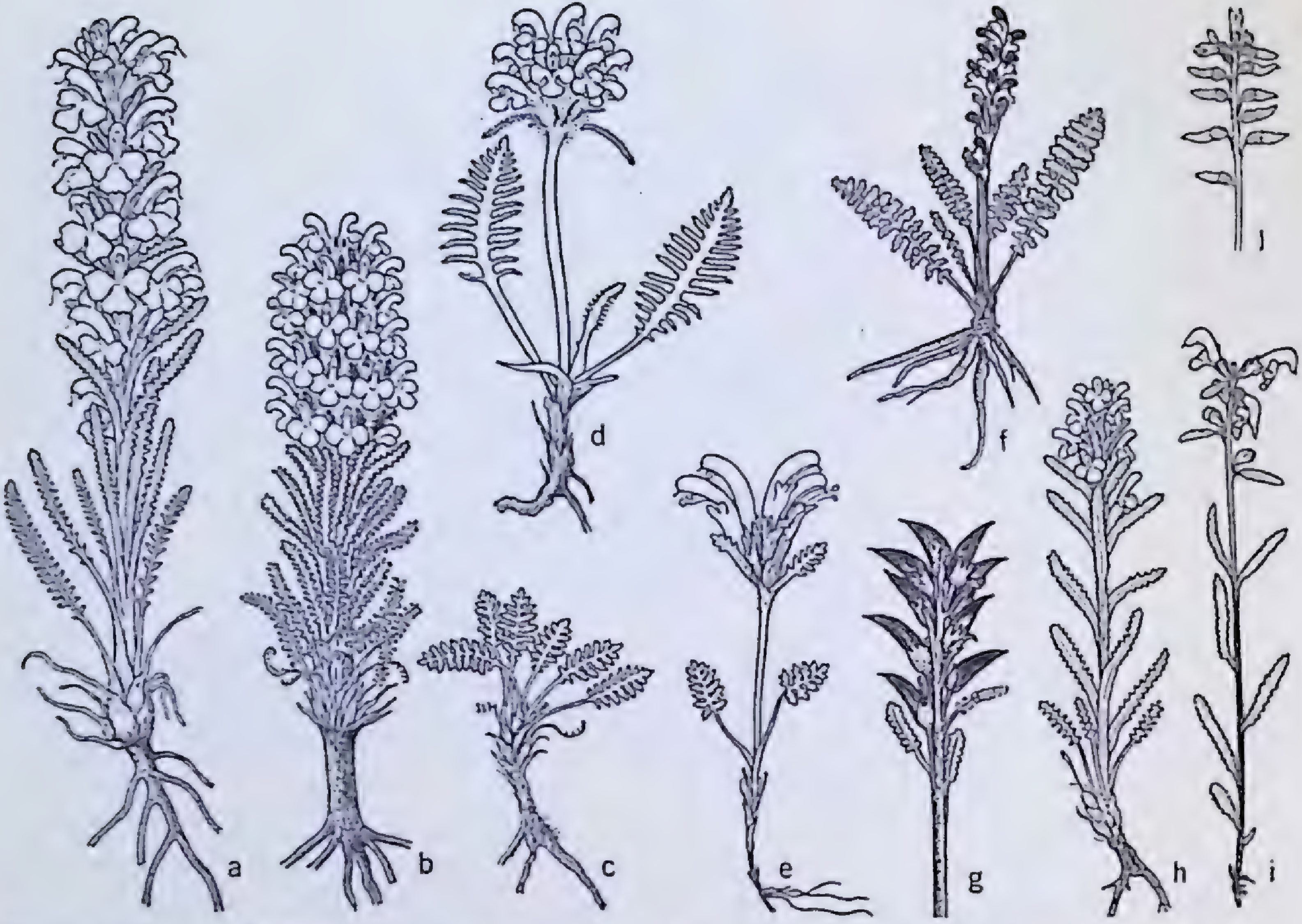

Figure 62. a. *Pedicularis arctica.* b, c. *P. lanata.* d. *P. sudetica.* e. *P. capitata.* f, g. *P. flammea.* h. *P. hirsuta.* i, j. *P. lapponica.* (2/5)

1. Veronica L. Speedwell

V. alpina L. var. **unalaschcensis** C. & S.—Small, dark-green perennial with slender, creeping rootstocks and ascending leafy stems; leaves mostly opposite, oval-elliptic, long-ciliate, shallowly toothed or entire, blackened in drying. Inflorescence racemose, first capitate but soon elongating; flowers small with long-villous calyx, dark blue corollas, and two stamens. Capsules bluish-black with a greenish sheen, and long gland-tipped hairs. Seeds small, bright yellow.

In wet mossy places by brooks and on snowbeds.

General distribution: N. America, subarctic-alpine. Fig. 63,a,b,c. Map 286.

2. Castilleja Mutis Painted-Cup

Ours tufted perennials with short, scaly rootstocks and ascending-erect stems with alternate, linear-lanceolate or caudate, entire or cut-lobed leaves, the uppermost bract-like, coloured, and usually more showy than the small yellow or reddish flowers.

1. **C. septentrionalis** Lindl.—Plant essentially glabrous, somewhat blackened in drying, with 20 to 50 cm. high stems, and entire, linear-lanceolate leaves; those of the inflorescence broader, obovate, greenish-white varying to yellow or pink.

Moist calcareous and rocky places.

General distribution: Subarctic eastern N. America. Fig. 61,a. Map 287.

2. **C. pallida** (L.) Spreng. ssp. **elegans** (Ostenf.) Pennell—Stems 5 to 25 cm. high, appressed pubescent or glabrate below, loosely pubescent or long-villous through the inflorescence. Leaves linear-lanceolate, caudate, pubescent; bracts purplish, sometimes with yellowish tips.

Moist, calcareous tundra or rocky or sandy lake shores.

General distribution: Endemic of the central Canadian Arctic. Fig. 61,b. Map 288.

3. Euphrasia L. Eyebright

E. arctica Lge.—Simple or branched, 2 to 25 cm. high, slender annual, with small, mostly opposite, short-pubescent, somewhat glandular, oval, coarsely crenate sessile leaves; the small flowers in a rather dense, leafy spike. Corollas 5 to 8 mm. long, white with lavender or pale blue veins, the upper lip bluish tinged.

Sunny, grassy slopes.

General distribution: Amphi-Atlantic: subarctic-alpine. Fig. 63,e,f. Map 289.

4. Bartsia L.

B. alpina L.—Tufted, dark-coloured perennial with a stout, scaly rootstock and viscid-villous, ascending-erect stems, 5 to 20 cm. high; leaves opposite, sessile, oval, crenate-serrate, the lowermost scaly, the upper 1 to 2 cm. long, dark purple, drying black. The flowers 2 cm. long, dark purple, solitary, in the uppermost leaf-axils.

Moist, turfy, and chiefly calcareous south-facing slopes.

General distribution: Amphi-Atlantic, subarctic-alpine. Fig. 61,d. Map 290.

5. Pedicularis L. Lousewort or Fernweed

Herbs with alternate, pinnate leaves, and irregular flowers in a racemose or spike-like inflorescence. Calyx tubular, somewhat inflated; the corolla 2-lipped, the upper lip laterally compressed, helmet-like, the lower 3-lobed; stamens 4; capsule compressed, containing a few large seeds.

The roots and young flowering stems of *P. lanata*, *P. arctica*, *P. hirsuta*, and *P. sudetica* may be eaten raw, or cooked as a pot-herb in soup. Eskimo children suck the sweet nectar from the base of the long corolla-tube of *P. lanata* and *P. arctica*.

Corolla predominantly yellow	
Helmet prolonged into a long beak	1. *P. lapponica*
Helmet beakless	
Biennial; stems simple or branched	2. *P. labradorica*
Perennial; stems simple	
Inflorescence capitate	3. *P. capitata*
Inflorescence spicate	4. *P. flammea*
Corolla pink or purple	
Plants with a tap-root; stems leafy	
Helmet with 2 small teeth near the apex	5. *P. arctica*
Helmet without teeth	
Corolla pink or purple	6. *P. lanata*
Corolla pale pink	7. *P. hirsuta*
Plants with branching rootstock and scapose stems	8. *P. sudetica*

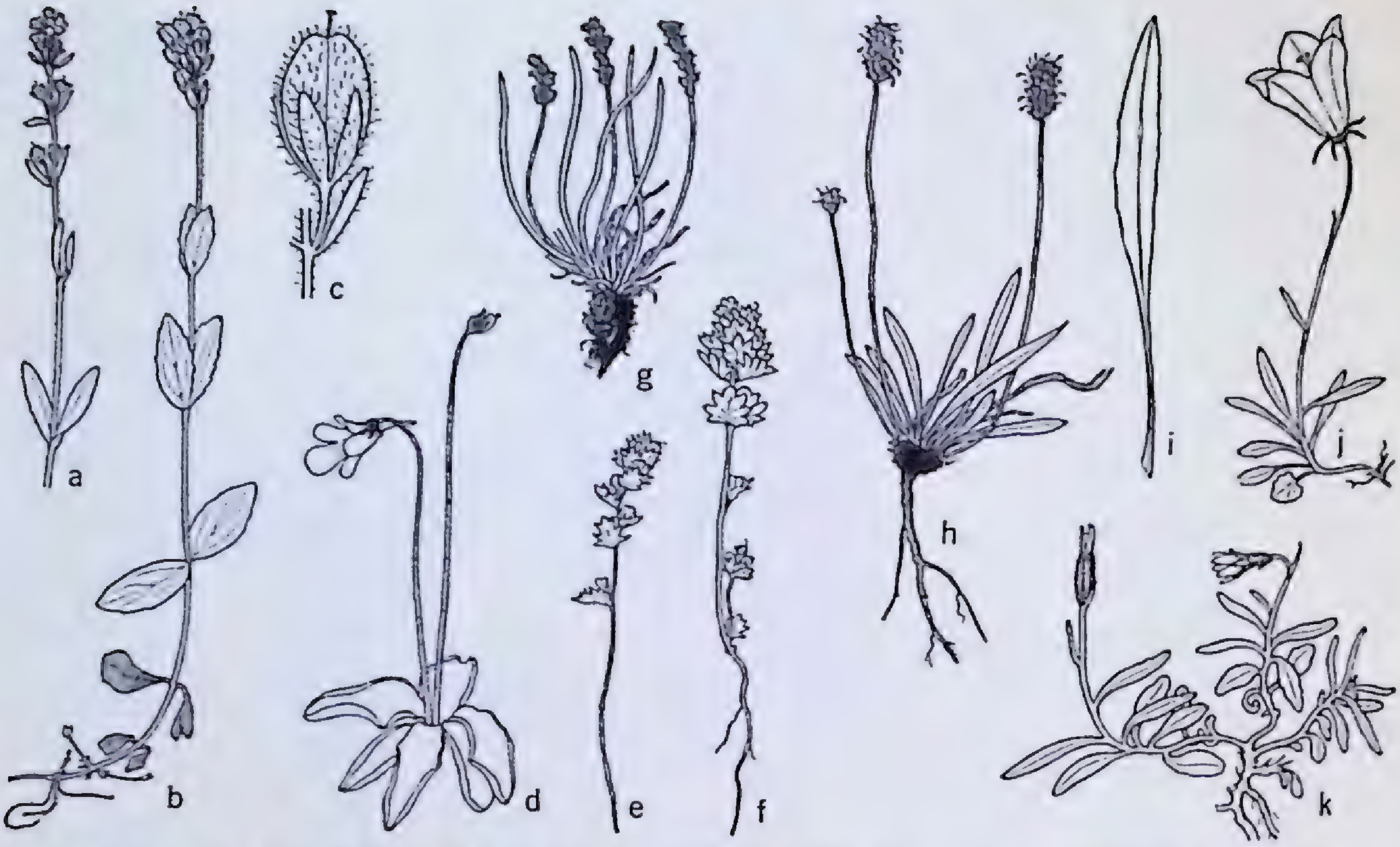

FIGURE 63. a, b, c. *Veronica alpina* var. *unalaschcensis*. d. *Pinguicula vulgaris*. e, f. *Euphrasia arctica*. g. *Plantago juncoides* var. *glauca*. h, i. *P. septata*. j. *Campanula rotundifolia*. k. *C. uniflora*. (2/5; c 2/1)

1. **P. lapponica** L.; LAPLAND LOUSEWORT—Essentially glabrous dwarf species with a slender, branching rootstock; stems purplish brown, simple, one or several together, 10 to 20 cm. high, leafy. Inflorescence short-spicate, few-flowered; flowers very fragant, with pale yellow corollas.

In rather dry, turfy places.

General distribution: Circumpolar, subarctic. FIG. 62,i,j. MAP 291.

2. **P. labradorica** Wirsing; LABRADOR LOUSEWORT—Biennial with a weak, spindly tap-root and simple or freely branched, leafy, glabrous or short-pubescent stems, 15 to 30 cm. high. Inflorescences short-spicate, 5- to 10-flowered, first subcapitate, soon elongating. Flowers yellowish, scentless; the helmet often somewhat purple-tinged, with two slender teeth near the tip.

In muskegs and open, mossy, not too dry heath.

General distribution: Circumpolar (with large gaps), subarctic. FIG. 61,c. MAP 292.

3. **P. capitata** Adams—Dwarf species with a slender, branched rootstock, and simple, scapose, glabrous or short, pubescent stems, 5 to 15 cm. high, terminating in a capitate 2- to 4 (rarely 6)-flowered head. Flowers very large and scentless; corollas 3 to 4 cm. long, creamy yellow, often with a reddish tinge.

Gravelly, calcareous tundra or heath.

General distribution: Circumpolar (with large gaps in arctic Europe, E. and W. Greenland); arctic-alpine. FIG. 62,e. MAP 293.

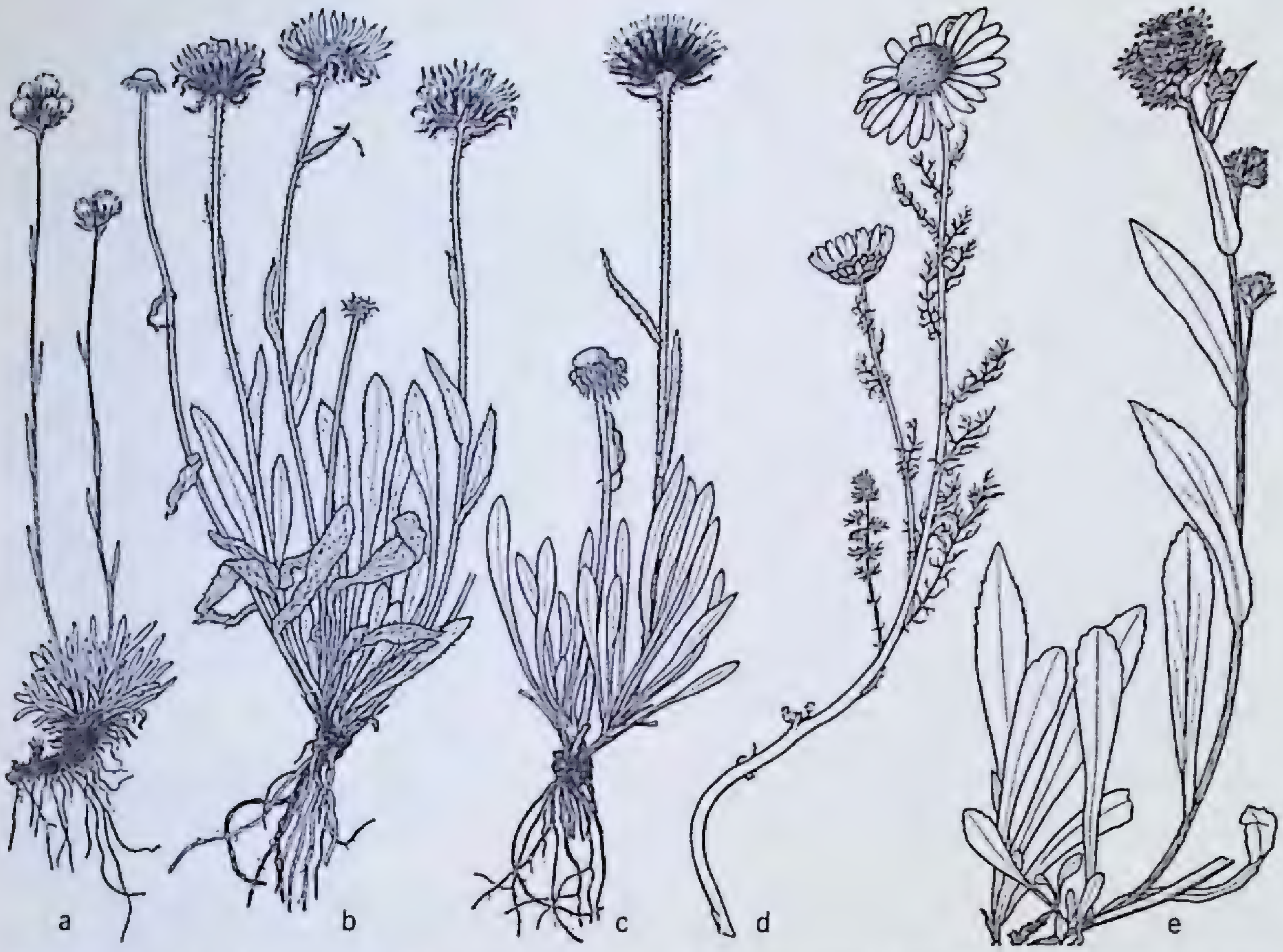

FIGURE 64. a. *Antennaria Ekmaniana*. b. *Erigeron grandiflorus*. c. *E. eriocephalus*. d. *Matricaria ambigua*. e. *Solidago multiradiata*. (2/5)

4. **P. flammea** L.—Roots spindly; stems one to several, simple, reddish-purple, essentially glabrous, sparingly leafy, 8 to 15 cm. high, terminating in a spike-like raceme of small, scentless flowers. Corolla 6 to 7 mm. long, the lip bright yellow, the helmet with a reddish-purple tip.

In rather moist calcareous tundra, on snowbeds and by lake shores.

General distribution: Amphi-Atlantic, arctic-alpine. FIG. 62,f,g. MAP 294.

5. **P. arctica** R. Br.—Tufted, with a pale yellow tap-root; stems one to several, 10 to 25 cm. high, essentially glabrous, leafy, terminating in a showy, loose-flowered, leafy spike of bright pink, spreading flowers. Corolla 20 to 25 mm. long with a prominently arched helmet which has two filiform teeth, 2 mm. long, near the tip. Seeds smooth, brown.

Moist tundra barrens.

General distribution: Endemic of arctic-alpine N.W. America. FIG. 62,a. MAP 295.

6. **P. lanata** Cham. & Schlecht.; WOOLLY LOUSEWORT—Similar, but with a bright lemon-yellow tap-root, stouter, densely white-woolly stem, and a dense-flowered, soon elongating, copiously woolly spike of faintly scented, showy flowers. Corolla deeper pink, or rarely white, the helmet not prominently arched, lacking teeth near the apex. Seeds large, with a loose-fitting, ashy-grey, honeycombed, seed-coat.

Common in moist, stony tundra.

General distribution: Circumpolar, arctic-alpine. FIG. 62, b,c. MAP 296.

7. **P. hirsuta** L.; HAIRY LOUSEWORT—Similar, but with a pale, spindly tap-root and slender stems, 5 to 20 cm. high, terminating in a sub-capitate, soon elongating spike of small, pale pink flowers. Helmet short and stubby. Seeds smooth, brown.

Moist, stony, and sandy places in tundra and by lake and river banks. In N.W. Greenland and in Ellesmere and Baffin Island, a form intermediate between *P. hirsuta* and *P. arctica* is found. It has the general habit of *P. hirsuta* but has the larger flower and minutely dentate helmet of *P. arctica*.

General distribution: Amphi-Atlantic, high-arctic. FIG. 62,h. MAP 297.

8. **P. sudetica** Willd.—Stems scapose, glabrous, dark purple, singly or several together, from a stout, branched rootstock. The white-woolly inflorescence first capitate but soon elongating. Corolla dark reddish purple, the helmet with two prominent teeth near the apex.

Rather wet, calcareous tundra and lake shores.

General distribution: Circumpolar (with a gap in Greenland), wide-ranging, arctic-alpine. FIG. 62,d. MAP 298.

35. LENTIBULARIACEAE Bladderwort Family

PINGUICULA L. Butterwort

P. vulgaris L.—Dwarf, scapose perennial herb with a rosette of entire, elliptic-spatulate, yellowish-green, succulent leaves that are glandular-viscid on the upper surface and act as traps for small insects which are held and digested by the mucilaginous secretion. Scapes one to several, 5 to 15 cm. high, glandular-pubescent; flowers 10 to 15 mm. long, the corolla bright violet, 2-lipped, the lower lip terminating in a straight spur.

In damp calcareous soil by the edge of brooks and ponds. In our area thus far collected only in S. Baffin Island.

General distribution: Circumpolar, subarctic, alpine. FIG. 63,d. MAP 299.

36. PLANTAGINACEAE Plantain Family

PLANTAGO L. Plantain

Tufted, scapose, perennial (ours) herbs with linear or linear-lanceolate leaves in radical rosettes, and small, regular 4-merous flowers in bracted heads or spikes. Capsule 2-locular, opening by a cup-shaped lid.

1. **P. juncoides** Lam. var. **glauca** (Hornem.) Fern.; SEASIDE PLANTAIN—Leaves linear, 2 to 3 mm. wide, fleshy and glabrous, equalling or slightly shorter than the erect, ascending or spreading, 5 to 10 cm. high, dark purple, sparingly hirsute scapes. Spikes short, cylindrical, 1 to 2 cm. long and 5 to 6 mm. wide.

Cliffs and sea-beaches, or occasionally by saline springs inland.

General distribution: Amphi-Atlantic, subarctic. FIG. 63,g. MAP 300.

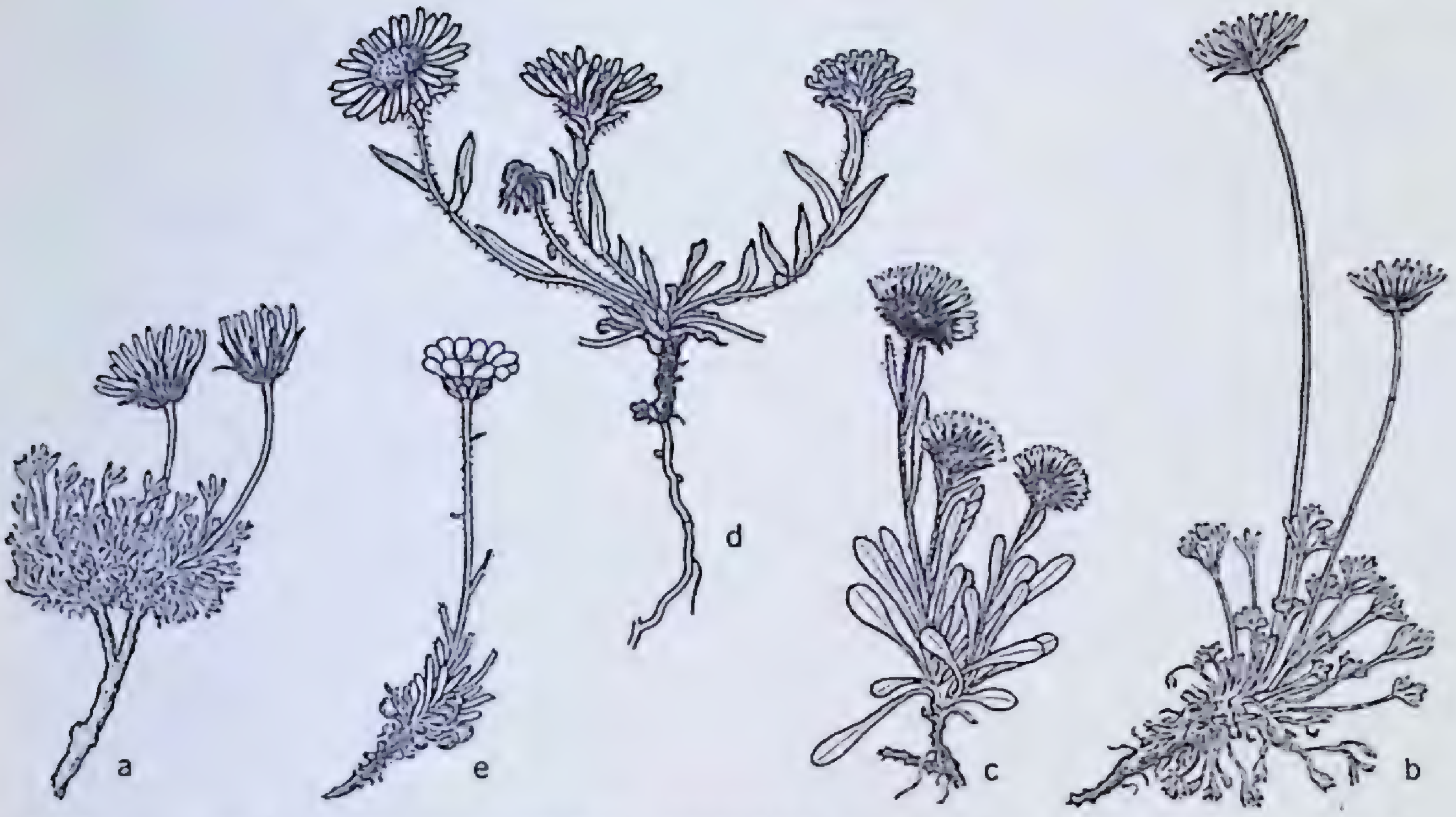

Figure 65. a. *Erigeron compositus* var. *discoideus*. b. *E. compositus* var. *glabratus*. c. *E. unalaschkensis*. d. *Aster pygmaeus*. e. *Chrysanthemum integrifolium*. (1/2)

2. **P. septata** Morris—Leaves linear-lanceolate, the blade 3 to 15 mm. wide, distinctly rough from short, stiff pubescence, especially on the slender petioles. Scapes stiffly erect, 15 to 30 cm. long, much longer than the leaves; spikes oblong-ovate, 2 to 4 cm. long and 8 to 10 mm. wide.

Dry calcareous cliffs and screes.

General distribution: Endemic of northern Cordillera and Mackenzie. Fig. 63,h,i. Map 301.

37. CAMPANULACEAE Bluebell Family

Campanula L. Bellflower

Perennial herbs with milky juice and alternate leaves. Flowers bell-shaped, regular, with 5-parted, united corolla, 5 stamens, one pistil, and inferior ovary; capsule many-seeded, opening by slits or pores.

1. **C. uniflora** L.—Stems solitary or few together, glabrous, rather stout and somewhat undulate, 5 to 30 cm. high, leafy; leaves dark green, subcoriaceous, linear-lanceolate. The small flower always solitary, slightly nodding during anthesis. Corolla narrowly campanulate, pale blue, 4 to 8 mm. in diameter, slightly longer than the calyx lobes.

Calcareous cliffs and gravelly screes.

General distribution: N. America, E. Asia, and W. Europe, arctic-alpine. Fig. 63,k. Map 302.

2. **C. rotundifolia** L.—Stems usually numerous, from a freely branching rootstock, glabrous, slender, erect or ascending, not undulate, 10 to 25 cm. high, leafy mainly in the lower half. Leaves thin, fresh green, the basal ones oval or round-cordate, long-petioled, soon wilting, those of the stem

linear. The large, blue, or rarely white flowers broadly campanulate, 10 to 20 mm. in diameter, solitary or several together, the corolla much longer than the calyx lobes.

Rocky, gravelly, or turfy places.

General distribution: *C. rotundifolia* s. lat.: Circumpolar (with large gaps), arctic-alpine. FIG. 63,j. MAP 303.

38. COMPOSITAE Sunflower Family

Ours perennial (or biennial) herbs (*Artemisia* sub-ligneous) with simple or compound leaves lacking stipules. Flowers small, aggregated on a flat, concave, or convex common receptacle into a close head (resembling a single large flower) surrounded by an involucrum of one to several rows of bracts (phyllaries). The flowers, of which the head is composed, may all be alike, or those of the centre may be different from those of the margin. The head is said to be discoid when all flowers have regular, tubular corollas (as in a thistle); ligulate when the corollas are irregular, one-sided, and strap-like (as in a dandelion); and radiate when the central flowers are discoid or tubular and the radial ones ligulate (as in a daisy). Calyx none, or its tube united with the ovary, the limb or pappus developed into persistent scales, teeth, capillary bristles or hairs that serve in the dispersal of the fruits by wind or by animals. Corollas united; stamens 5, their anthers usually united into a tube through which the simple, usually 2-cleft, style protrudes. Fruit an achene.

- a. Heads discoid, the central flowers bisexual, all tubular and only the marginal flowers (when present) ligulate or strap-like, pistillate or neutral. Plants without milky sap or juice
  - b. Heads of only tubular flowers (discoid)
    - c. Pappus of capillary bristles
      - d. Involucral bracts (phyllaries) membranaceous; plants white or greenish-grey from a close white tomentum
        - e. Basal leaves larger and different from those of the flowering stem 4. ANTENNARIA
        - e. Basal leaves similar to those of the flowering stem 5. GNAPHALIUM
      - d. Involucral bracts firm or at most merely with membranaceous margins; plants essentially green
        - f. Leaves all basal; flowering stems pale and scaly, appearing before the leaves; flowers white or creamy 9. PETASITES
        - f. Cauline leaves present; flowers yellow 11. SENECIO
    - c. Pappus none, or a mere crown 8. ARTEMISIA
  - b. Heads of tubular and ligulate flowers (radiate)
    - g. Pappus of capillary bristles
      - h. Ray or ligulate flowers yellow
        - i. Leaves opposite; heads large 10. ARNICA
        - i. Leaves alternate; heads medium to small
          - j. Involucral bracts in one series 11. SENECIO
          - j. Involucral bracts in several series 1. SOLIDAGO
      - h. Rays not yellow
        - k. Leaves appearing after the flowers 9. PETASITES
        - k. Leaves appearing before the flowers
          - l. Heads on leafy stems 2. ASTER
          - l. Heads on naked or few-leaved peduncles 3. ERIGERON
    - g. Pappus none, or merely a crown
      - m. Leaves simple; stems scapose 7. CHRYSANTHEMUM
      - m. Leaves compound; stems branched 6. MATRICARIA
- a. Corollas all ligulate or strap-like. Plants with milky sap or juice
  - n. Pappus inserted at the end of a long, slender beak 12. TARAXACUM
  - n. Pappus sessile 13. CREPIS

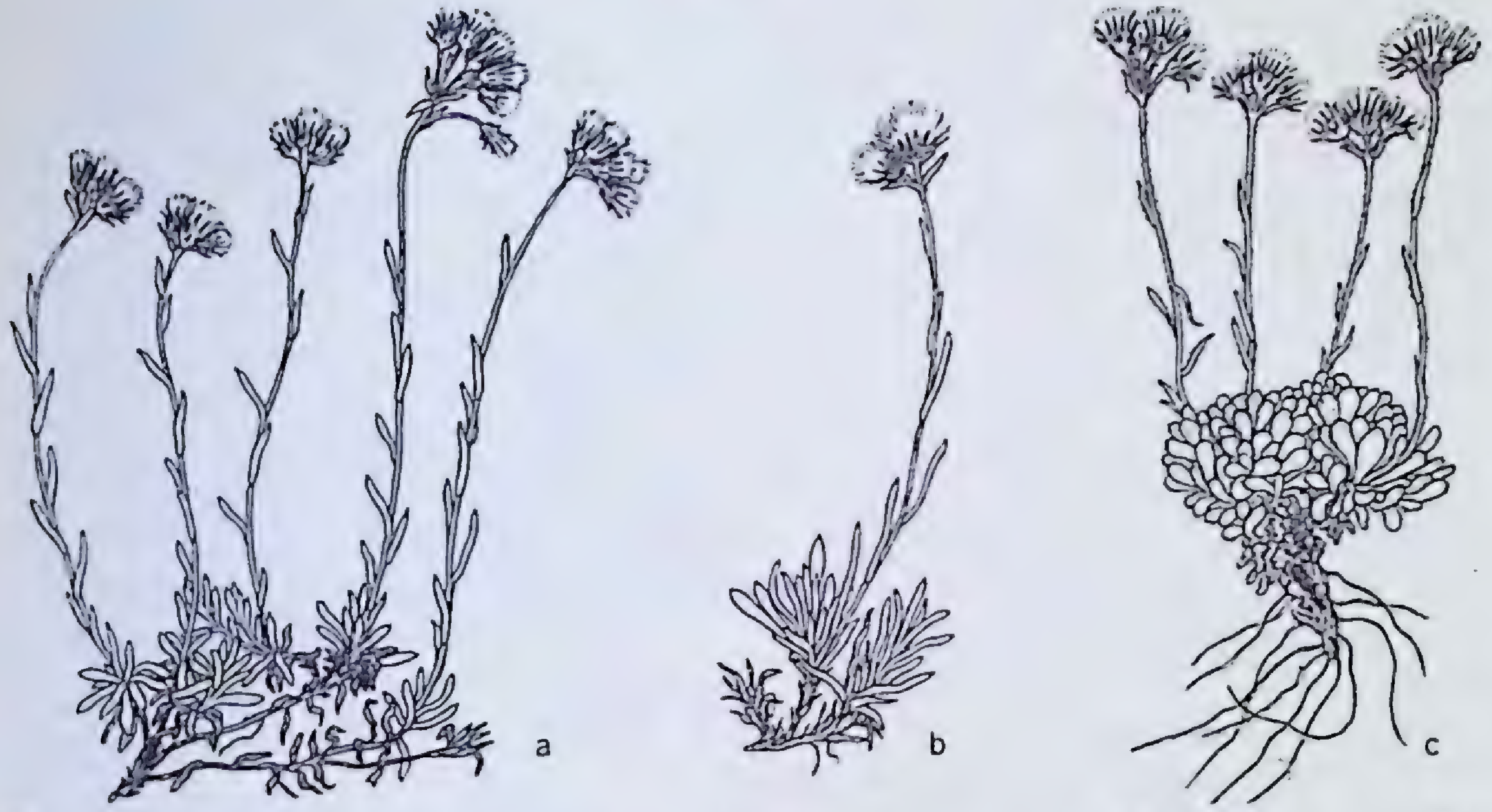

FIGURE 66. a. *Antennaria canescens.* b. *A. angustata.* c. *A. compacta.* (1/2)

1. SOLIDAGO L. Goldenrod

S. multiradiata Ait.—Stems tufted, erect-ascending, 5 to 20 cm. high; leaves oblanceolate, glabrous, those of the sterile rosettes crenate-serrate, petiolate, those of the stem linear, entire, shorter, and sessile. Inflorescence of small, yellow-flowered heads in a dense corymb.

In dry, gravelly, or rocky places.

General distribution: Widely distributed, subarctic American species, ranging from Alaska to Labrador north beyond the tree-line. FIG. 64,e. MAP 304 (s. str).

2. ASTER L. Aster

A. pygmaeus Lindl.—A low perennial, 4 to 11 cm. high, with a creeping rhizome producing ascending leaf- and flower-bearing shoots; radical and stem leaves sessile, oblong, obtuse, entire, glabrous or woolly along the margins, about 25 mm. long and 4 mm. wide. Flowering heads single, involucrum densely white-woolly; ray or ligulate flowers lilac; pappus reddish brown.

General distribution: A rare and little known species thus far collected only a few times in the Coronation Gulf – Great Bear Lake area and in Banks and Victoria islands. FIG. 65,d. MAP 305.

3. ERIGERON L. Fleabane

Low herbs with entire or divided leaves; ours with solitary, peduncled heads with densely woolly involucrum; white, pink, or lilac ray flowers and yellow disk flowers.

Leaves ternately divided	1. *E. compositus*
Leaves entire, oblong-lanceolate	
Caespitose, tufted with a fibrous root	
Heads 2 cm. diameter	2. *E. eriocephalus*
Heads 1 cm. diameter	4. *E. unalaschkensis*
With a stout, ascending rootstock; heads large	3. *E. grandiflorus*

1. **E. compositus** Pursh—Low, densely caespitose, somewhat glandular and hispid, with a much-branched base. Basal leaves densely crowded, once ternate in var. *discoideus* Gray, 2- to 3-ternate in var. *glabratus* Macoun, the segments linear. Flowering stems scapiform, 5 to 15 cm. high. Ray flowers white or pale lilac, in some forms wanting. In the Arctic Archipelago represented mainly by var. *discoideus*.

Dry, gravelly, and perhaps always calcareous soil.

General distribution: N. American, arctic-alpine. Fig. 65,a. var. *discoideus*, Fig. 65,b. var. *glabratus*. Map 306.

2. **E. eriocephalus** J. Vahl—Tufted; the leaves and stems shaggy from long, woolly grey or white hairs. Flowering stems, stout, 5 to 20 cm. high, often several from the same base. Heads large, the involucrum densely grey-villous. Ray flowers white, turning pale lilac. Pappus light brown.

A high-arctic species often growing in glacial till, mainly on calcareous soil.

General distribution: N. American extending into W. Arctic Europe, and E. Asia; arctic. Fig. 64,c. Map 307.

3. **E. grandiflorus** Hook.—Basal leaves oblanceolate, 5 to 6 cm. long and 5 to 6 mm. wide, grey-villous on both sides. Flowering stems 1 to 6, stout and stiffly erect, 10 to 15 cm. high, villous, bearing 2 to 4 reduced leaves. Heads large, 2.5 to 3.5 cm. wide. Involucrum grey-villous. Ray flowers pale lavender, often drying yellow.

Calcareous slopes and dry tundra.

General distribution: Endemic of alpine and arctic N.W. America. Fig. 64,b. Map 308.

4. **E. unalaschkensis** (DC.) Vierh.—Resembling No. 2 but smaller and lacking its grey-villous pubescence. Heads smaller, the involucres covered by bluish-black, densely crinkled hairs.

In moist, grassy places, often growing in herbmats below perennating snowbanks.

General distribution: Circumpolar, subarctic-alpine. Fig. 65,c. Map 309.

4. ANTENNARIA Gaertn. Everlasting

Low, perennial, dioecious plants of tufted or matted habit, ours with small, linear-oblong leaves. Flowering stems solitary or several together, bearing several sessile, strap-like leaves and terminating in a corymbiform inflorescence of 1 to 5 small heads. Although the genus normally is dioecious, apogamy is widespread, and within our area only the female plant of each species is known.

- Plant of matted growth with basal rosettes from freely branched and creeping rootstocks or stolons — 1. *A. canescens*
- Plant densely tufted with sessile or subsessile basal rosettes
  - Heads normally one, rarely with a smaller lateral head
    - Plant fresh green, almost glabrous — 2. *A. glabrata*
    - Plant grey from a thin tomentum of appressed hairs — 3. *A. angustata*
  - Heads several
    - Basal leaves narrowly oblanceolate, tapering toward the apex — 4. *A. Ekmaniana*
    - Basal leaves short, obovate — 5. *A. compacta*

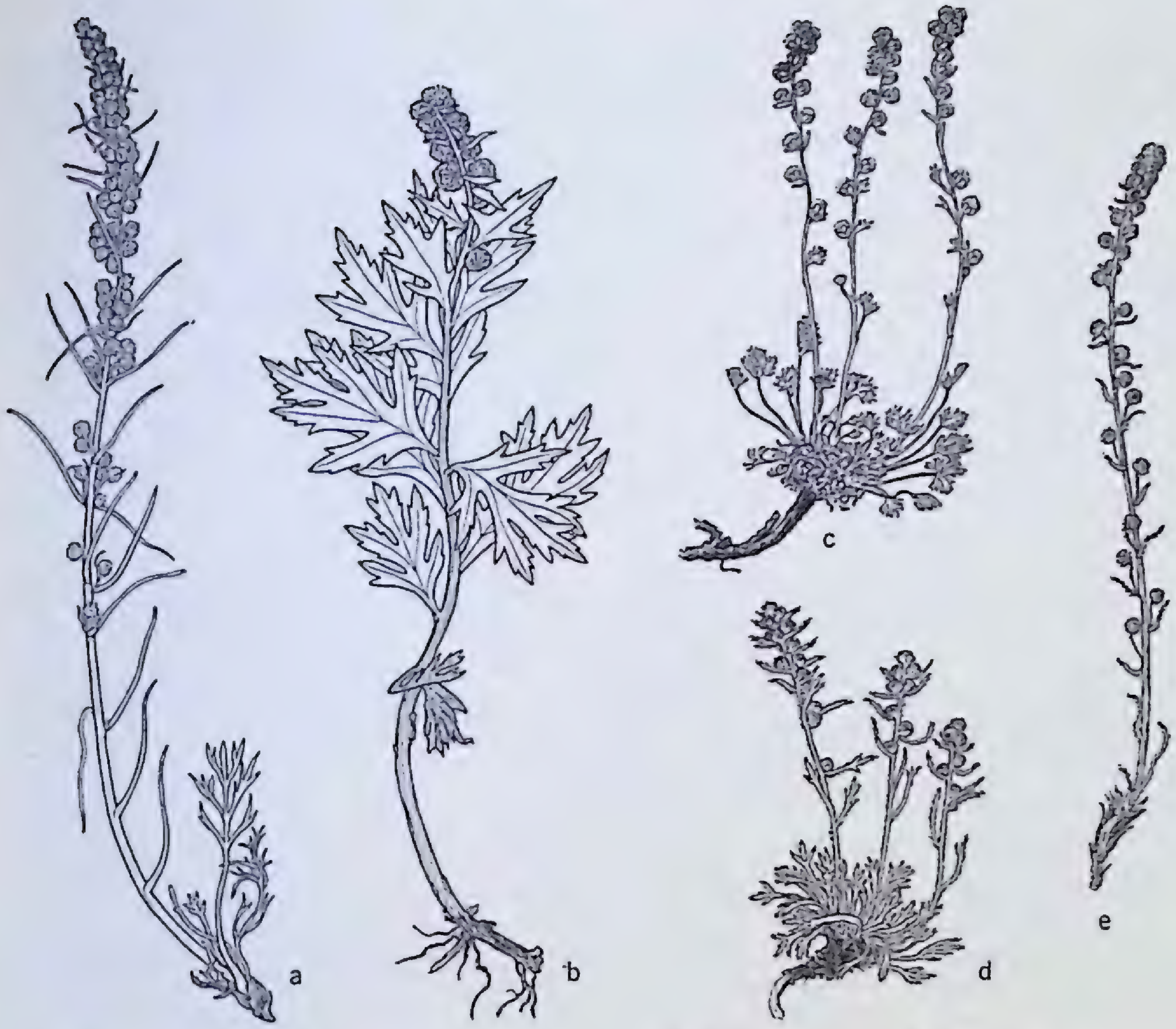

FIGURE 67. a. *Artemisia borealis.* b. *A. Tilesii.* c. *A. hyperborea.*
d, e. *A. Richardsoniana.* (2/5)

1. A. **canescens** (Lge.) Malte—Densely matted, with well-developed, creeping and spreading stolons. Basal leaves permanently and densely ashy grey appressed-tomentose on both sides. Flowering stems 5 to 15 cm. high, terminating in a dense corymb, usually of three heads.

Commonly on dry, non-calcareous, sunny slopes and in herbmats.

General distribution: Endemic of subarctic, eastern N. America. FIG. 66,a. MAP 310.

2. A. **glabrata** (J. Vahl) Greene—Forming rather compact, firm tufts up to 10 cm. in diameter, with numerous sessile or subsessile rosettes of fresh green leaves. Flowering stems 5 to 10 cm. high, slender and weak, in large specimens often ten or more together, each terminating in a single head.

Herbmats and snowbeds on calcareous soil.

General distribution: A low-arctic species endemic of central W. Greenland and central Baffin Island. MAP 311.

3. A. **angustata** Greene—Similar to No. 2 but never fresh green, the leaves and stems always appearing grey from a thin covering of appressed hairs. Tufts smaller and flowering stems often solitary or rarely more than 2 to 3 together. Heads normally solitary.

In non-calcareous, gravelly or rocky, but not too dry places.

General distribution: N. America, arctic-alpine. Fig. 66,b. Map 312.

4. A. **Ekmaniana** Porsild; *A. labradorica* auctt. non Nutt.—Forming small compact tufts with numerous sessile rosettes of narrowly oblanceolate, permanently ashy-grey, tomentose leaves, 10 to 20 cm. long. Flowering stems one to several, 10 to 20 cm. high, terminating in a dense corymb, usually of 3 to 4 heads.

Non-calcareous, rocky, turfy or gravelly places.

General distribution: N. America, wide-ranging, arctic or high-arctic. Fig. 64,a. Map 313.

5. A. **compacta** Malte—Densely caespitose almost pulvinate, with a stout ascending and often branched rootstock. Basal leaves broadly oblanceolate-obovate, less than 1 cm. long, permanently ashy grey on both sides, from appressed felt-like hairs. Flowering stems 5 to 10 cm. high, slender, and usually somewhat arched, copiously floccose-tomentose, bearing a dense corymb of 2 to 4 rather small heads.

Dry, calcareous, rocky places.

General distribution: An arctic-alpine species, endemic of N.W. America. Fig. 66,c. Map 314.

A. **subcanescens** Ostenf.—Similar to No. 5 but tufted rather than pulvinate; the basal leaves longer, grey, thinly appressed tomentose, and the stems showing purple under the thin, non-floccose tomentum.

Dry, calcareous, rocky places. Endemic to arctic-alpine N.W. America.

5. Gnaphalium L. Cudweed

G. **norvegicum** Gunn.—Tufted perennial with sessile rosettes of sericeous, linear-oblanceolate, 3-ribbed leaves, 6 to 8 cm. long; flowering stems 20 to 30 cm. high, leafy, terminating in a thick, interrupted, leafy spike of small brownish heads.

In herbmats and among willows.

General distribution: Amphi-Atlantic, subarctic-alpine species doubtfully recorded in 1863 from the Cumberland Sound region of Baffin Island by J. Taylor. Its presence within our area has not been verified by subsequent collectors.[1]

G. **supinum** L.—Tufted dwarf perennial with soft-silky, linear-lanceolate leaves, and simple stems 5 cm. high terminating in an inflorescence of a few approximate heads.

Edge of snowbeds; moist turfy and gravelly places. Amphi-Atlantic, subarctic, alpine.

6. Matricaria L. Wild Chamomile

M. **ambigua** (Ledeb.) Kryl.—A short-lived, glabrous perennial with bipinnate, finely divided leaves and leafy, erect or ascending, simple or branched stems, 10 to 30 cm. high, bearing from one to several large, flowering heads that may be 3 to 5 cm. in diameter when fully expanded. Ray flowers pure white.

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[1] In the British Museum (Natural History) is a specimen labelled "Gnaphalium Loc. Cum [berland] Strait Lat. 65° 50′ J. Taylor". This plant is not a *Gnaphalium* but is, without doubt, *Antennaria glabrata*.

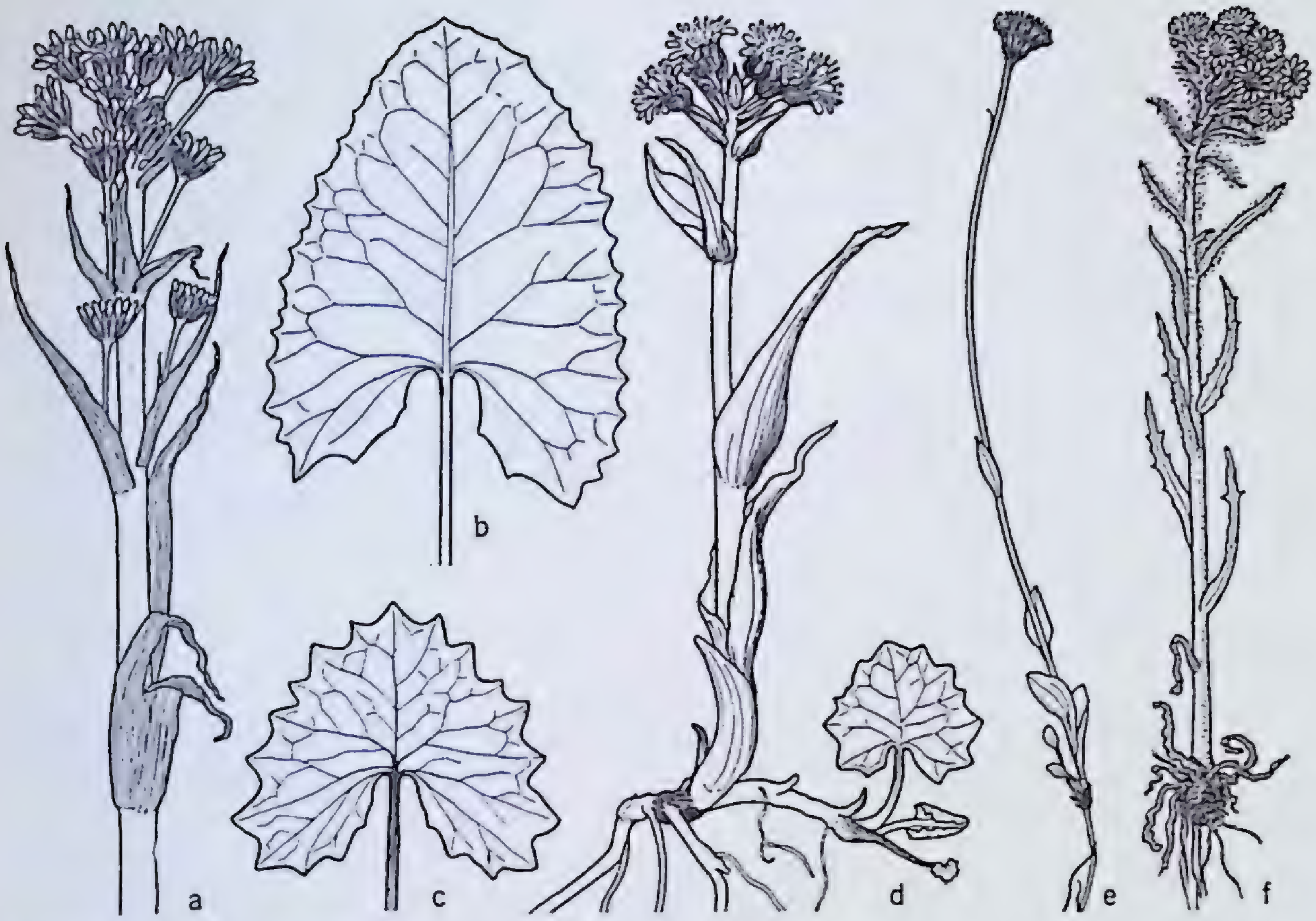


FIGURE 68. a, b. *Petasites sagittatus.* c, d. *P. frigidus.*
e. *Senecio atropurpureus* (form with discoid head). f. *S. congestus.* (2/5)

In moist, sandy places by the seashore and sometimes among grasses near human habitation.

General distribution: Low-arctic, nearly circumpolar. FIG. 64,d. MAP 315.

7. CHRYSANTHEMUM L.

C. integrifolium Richards.—Tufted dwarf perennial from a branched base. Basal leaves linear, 15 to 20 mm. long; flowering stems 5 to 10 cm. long, woolly above, with one or more reduced leafy bracts, terminating in a single head from 1 to 1.5 cm. in diameter. Ray flower pure white.

Stony, calcareous barrens.

General distribution: N. America, arctic-alpine. FIG. 65,e. MAP 316.

C. arcticum L.—Basal leaves cuneate with triangular lobes or teeth, fleshy and glabrous; stems simple, 15 to 25 cm. high, with a single (very rarely 2 or 3) large heads, 3 to 4 cm. in diameter. Ray flowers white.

Moist, saline meadows or in moist gravel by the seashore. Alaska and Yukon east beyond Mackenzie R., reappearing again on the shores of Hudson and James bays.

8. ARTEMISIA L. Wormwood

Perennial, sub-ligneous herbs, some aromatic, with once or twice pinnate leaves and numerous small, commonly nodding, panicled, spicate, or racemose heads.

- Caespitose, densely tufted with a stout tap-root ending in a much-branched crown
  - Basal leaves twice pinnate, segments 1–2 mm. wide, usually 5 cm. long or less
    - Basal leaves short, silvery-grey from appressed silky hairs
      - Inflorescence racemose, not leafy . . . 1. *A. hyperborea*
      - Inflorescence spicate, leafy . . . 2. *A. borealis*
    - Basal leaves as well as flowering stems densely white-villous; inflorescence spicate, leafy . . . 3. *A. Richardsoniana*
- Not caespitose, with a freely branched rootstock; basal leaves once-pinnate, usually over 5 cm. long, the segments 3–8 mm. wide . . . 4. *A. Tilesii*

1. **A. hyperborea** Rydb.—A rather attractive species with silvery-grey strongly aromatic leaves and somewhat flexuous flowering stems 10 to 20 cm. high. The inflorescence an elongated raceme of relatively large, solitary, somewhat nodding heads, the lowermost on long pedicels.

On dry, sunny, calcareous rocks.

General distribution: Endemic of western arctic N. America. FIG. 67,c. MAP 317.

2. **A. borealis** Pall.—Differs from the preceding by its leafy inflorescence of smaller heads, the lowermost sometimes pedicellate and usually 2 or more together. Foliage not strongly aromatic.

In dry, sandy places, often near sea or lake shores or on river-banks.

General distribution: Circumpolar, widely distributed, subarctic. FIG. 67,a. MAP 318.

3. **A. Richardsoniana** Bess.—Entire plant strikingly hoary-villous. Flowering stems 5 to 15 cm. high, leafy; the inflorescence a leafy spike of small, sessile heads.

Dry, calcareous, sandy or gravelly places.

General distribution: Endemic of the N. American western Arctic. FIG. 67,d,e. MAP 319.

4. **A. Tilesii** Ledeb.—A tall, weedy species with a freely branched, thin rootstock and leafy stems 10 to 50 cm. high. The large pinnately lobed leaves green and glabrous above, grey-canescent beneath. Heads small, somewhat nodding. The var. *elatior* T. & G., with narrower leaf-segments and a simple and narrower inflorescence of smaller heads, is a taller plant of less northern range, thus far not reported from the Archipelago.

In sandy places, often near the beach.

General distribution: Asia, N.W. America, subarctic. FIG. 67,b. MAP 320.

9. PETASITES Mill. Sweet Coltsfoot

Coarse perennial plants with large cordate or triangular, variously-toothed leaves arising from a rhizome. The scaly flowering scapes, terminating in a cluster of whitish, fragant flowers, appear before the leaves. The young leaves and flowering stems may be eaten raw as salad or cooked as a pot-herb.

1. **P. frigidus** (L.) Fries—Leaves more or less triangular, rather coarsely toothed or lobed.

In moist, sandy places by sheltered lake shores and by the edge of small streams.

General distribution: Nearly circumpolar, arctic, with a large gap in eastern arctic N. America. FIG. 68,c,d. MAP 321.

2. **P. sagittatus** (Banks) A. Gray—Leaves oblong, heart-shaped, or obtusely triangular, finely toothed.

In similar places.

General distribution: N. American, widely distributed, low-arctic species barely entering our area in the northern Hudson Bay area (Mansel I.). FIG. 68,a,b. MAP 322.

10. ARNICA L.

A. alpina (L.) Olin ssp. **angustifolia** (Vahl) Maguire—A tufted perennial with a short, stout rootstock, terminating in a rosette of lanceolate petioled leaves and a simple stem, 10 to 30 cm. high, with one to two pairs of linear, sessile leaves, and one or rarely three large, yellow heads.

Dry, sandy or gravelly slopes. In our area commonly found below bird cliffs and near animal dens.

General distribution: N. America, wide-ranging, arctic. FIG. 70,d. MAP 323.

A. alpina (L.) Olin ssp. **Sornborgeri** (Fern.) Maguire; *A. terrae-novae* Fern.—Distinguished from ssp. *angustifolia* by its narrower leaves and by its (usually) 3 to 5 pairs of stem leaves.

Dry, calcareous slopes. Thus far known only from the east coast of Hudson Bay, northern Labrador-Ungava, and Newfoundland.

11. SENECIO L. Groundsel

Yellow-flowered herbs. Heads many-flowered, the central and tubular ones perfect, the ligulate pistillate, or none.

Heads solitary	1. *S. atropurpureus*
Heads several	
Flowering heads small and numerous, densely aggregated in several sessile or peduncled glomerules	2. *S. congestus*
Heads few, large	3. *S. hyperborealis*

1. **S. atropurpureus** (Ledeb.) Fedtsch; *S. frigidus* (Richards.) Less.—Stems, 5 to 20 cm. high, mostly solitary from a creeping rootstock, bearing 4 to 6 sessile linear-lanceolate leaves. Basal leaves petiolate, the blade ovate 1 to 2 cm. long, sub-entire.

The solitary head normally with disk and ligulate flowers (FIG. 69,a), but heads in which the latter are wanting are not uncommon (FIG. 68e).

Common in not too dry, peaty soil.

General distribution: Arctic Eurasia and N.W. America. FIGS. 68,e; 69,a. MAP 324.

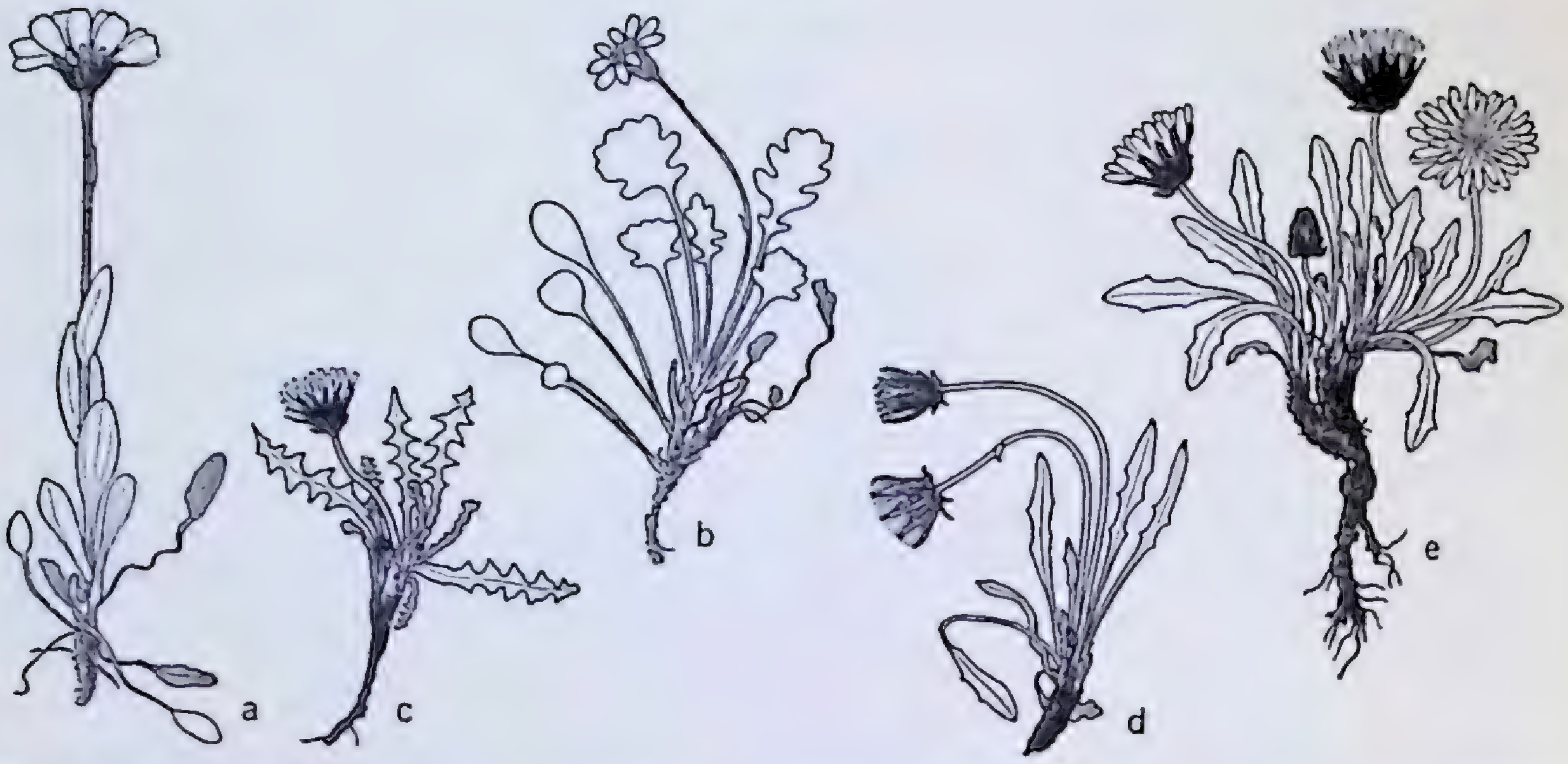


FIGURE 69. a. *Senecio atropurpureus* (with normal, radiate head). b. *S. hyperborealis* c. *Taxaracum pumilum.* d. *T. phymatocarpum.* e. *T. hyparcticum.* (2/5)

2. **S. congestus** (R. Br.) DC.—Stems solitary or clustered from a short and fibrous root, 10 to 30 cm. high, thick, densely brownish-yellowish hirsute above, hollow and easily compressed, bearing numerous sessile, linear-oblong, sinuate-toothed leaves. The numerous small heads in one large, or several smaller, variously stalked glomerules.

A coarse, weedy plant, commonly found in moist but sheltered places near the seashore. The young leaves and flowering stems are edible and may be used as salad or potherb. Normally the plant is hapaxanthic or once-flowering, dying completely after having flowered and produced seeds, but in the high latitudes, specimens in which the flowers of the year were killed by early frost, may produce flowers the following year.

General distribution: Circumpolar, arctic. FIG. 68,f. MAP 325.

3. **S. hyperborealis** Greenm.—Perennial, with a short, branched base. Leaves mostly basal, lyrate. Stems few to several, 5 to 25 cm. high, bearing from one to several heads.

Dry, calcareous slopes and cliffs.

General distribution: Endemic of N.W. America; thus far collected but once in the Archipelago. FIG. 69,b. MAP 326.

S. lugens Richards.—Stems leafy, 30 to 50 cm. tall, from a creeping rootstock. Basal leaves 10 to 15 cm. long and 10 to 15 mm. wide, repand dentate, the blade tapering into a narrow petiole. Heads 5 to 8, 10 to 15 mm. in diameter, in a loose corymb; the inner involucral bracts prominently black-tipped.

Moist herbmats, lake shores and river-banks, often among willows. Alaska and Yukon east to Coppermine R., south in the Rocky Mts. to beyond the 50th parallel.

SAUSSUREA DC.

S. angustifolia (Willd.) DC.—Perennial herb from a creeping, cord-like rootstock. Stems dark purple, leafy, 10 to 30 cm. high, the lower leaves 5 to 10 cm. long, 5 to 10 mm. wide, sinuate-margined, tapering into a narrow petiole, the upper much reduced. Heads discoid, 3 to 5, usually in a dense corymb; involucral bracts in 3 to 4 rows; corollas purple.

Dry tundra. Alaska east to Keewatin, north to the Arctic Coast. E. Asia.

12. TARAXACUM Weber; Dandelion

Perennial herbs with runcinate to subentire leaves in a rosette, and solitary showy heads on naked, hollow peduncles. Corollas yellow or creamy white. The involucral bracts in two or three rows, with or without corniculate tips or appendages. The lower or outer ones usually shorter and broader than the inner. The achenes fusiform, 4 to 5 ribbed, muricate above, and prolonged into a long, slender beak, bearing a whorl of slender, spreading pappus. Relatively few species of dandelions are represented in the flora of arctic North America where some are widely distributed and presumably old and stable species, whereas others are of endemic and restricted range. Some produce good pollen and may thus reproduce sexually, but in others fertile pollen is always lacking; in these the fruits or seeds are produced parthenogenetically, without fertilization.

The leaves of all species, especially when young and tender, make an excellent salad, and throughout the summer may be used as a pot-herb.

- Tips of inner involucral bracts with prominent corniculate appendages. Leaves deeply runcinate — 1. *T. lacerum*
- Tips of inner involucral bracts lacking corniculate appendages or the tips merely callose
  - Tall species with scapes 15 to 25 cm. high
    - Leaves coarse, not deeply runcinate; heads large; flowers yellow. Low-arctic species — 2. *T. lapponicum*
    - Leaves subentire, slender; flowers creamy yellow, often suffused with pink. High-arctic species — 3. *T. hyparcticum*
  - High-arctic dwarf species with scapes rarely 15 cm. tall
    - Leaves deeply runcinate; flowers bright yellow; heads expanding — 4. *T. pumilum*
    - Leaves subentire, slender; heads small, turbinate, not expanding in anthesis — 5. *T. phymatocarpum*

1. **T. lacerum** Greene—Mature specimens with numerous leafy rosettes and flowering scapes. Leaves narrow, deeply runcinate, yellowish-green, the midrib usually purplish, not much shorter than the scapes. Flowering heads large, when fully expanded 5 to 6 cm. in diameter. The involucrum dark green, its bracts with large corniculate appendages. Flowers pale yellow. Pollen present. Fruit dull yellowish-grey.

In somewhat moist places, often on mineral soil near the seashore but frequently also near animal or human habitations.

General distribution: N. America, widely distributed, arctic-subarctic. FIG. 70,b. MAP 327.

2. **T. lapponicum** Kihlm.; T. *croceum* Dahlst.—A coarse plant with broad, oblanceolate, not deeply runcinate, fresh green, somewhat fleshy leaves, usually shorter than the scapes. Flowering heads large, when fully expanded 5 to 6 cm. in diameter, the involucrum thin and herbaceous, its bracts unappendaged. Flowers dark yellow, lacking pollen. Fruits olivaceous, smooth below the muricate summit.

In moist, grassy herbmats, rarely on mineral soil.

General distribution: Amphi-Atlantic, subarctic-alpine. FIG. 70,a. MAP 328.

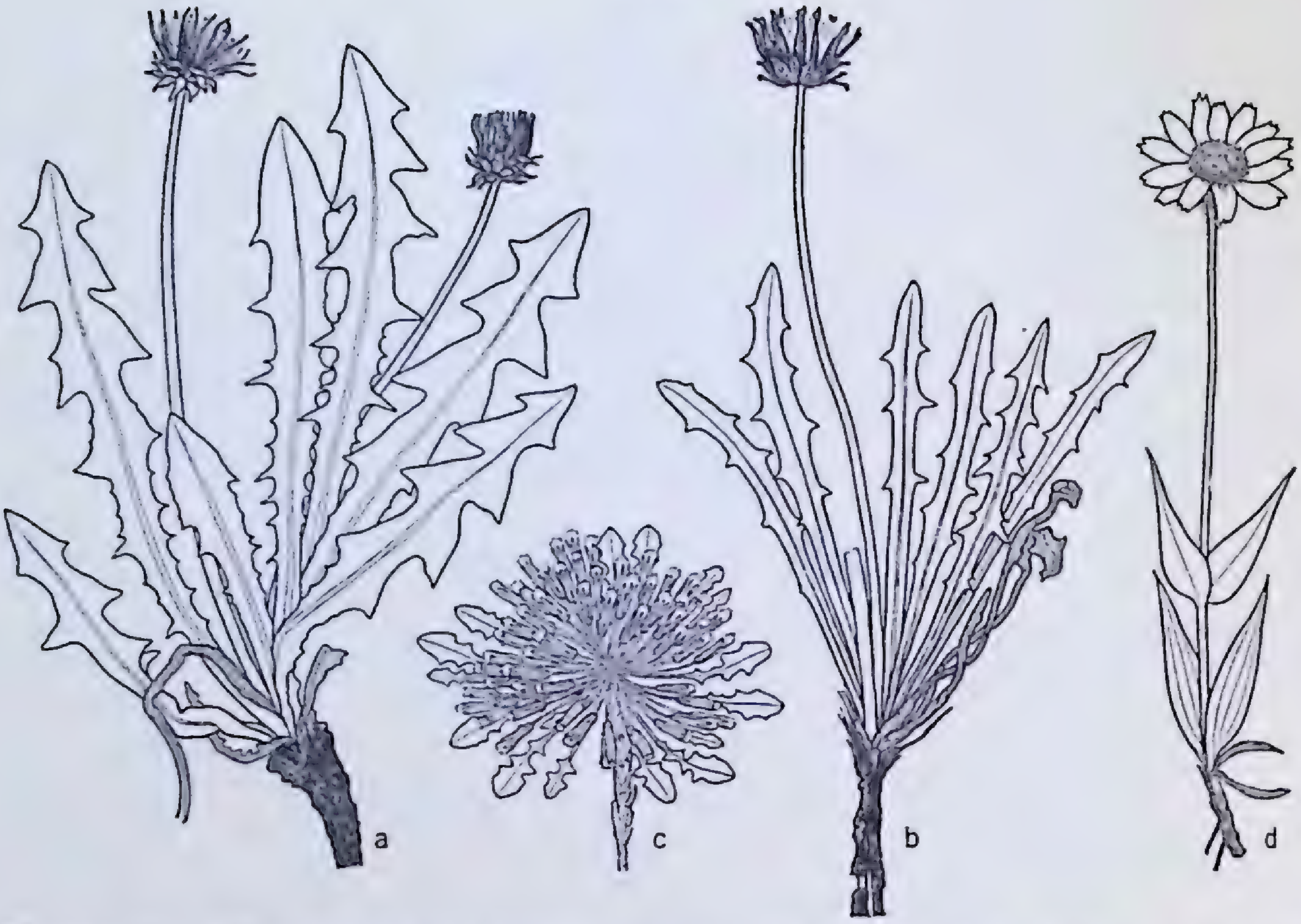


FIGURE 70. a. *Taraxacum lapponicum.* b. *T. lacerum.* c. *Crepis nana.* d. *Arnica alpina* ssp. *angustifolia.* (2/5)

3. **T. hyparcticum** Dahlst.—A strikingly handsome species with slender, oblanceolate, fresh green leaves with sparsely toothed or subentire margins, and tall slender scapes. Heads, 3 to 4 cm. in diameter when fully expanded; involucres bluish-black, somewhat pruinose, the tips of the bracts somewhat callose but rarely with small corniculate appendages. Flowers creamy yellow, often with a pink tinge; pollen lacking. Fruit dark olivaceous.

In grassy and well-manured places, often near animal or human habitations where some specimens may produce upwards of 80 scapes from one root.

General distribution: Endemic of the Canadian Arctic Archipelago, high-arctic. FIG. 69,e. MAP 329.

4. **T. pumilum** Dahlst.—A dwarf species with short, often spreading, deeply runcinate, dark green leaves; scapes usually 1 to 3 from each root, approximately 5 cm. high, or as long as the leaves, often decumbent.

The flowering heads about 2 cm. in diameter when fully open; involucres olive green, somewhat pruinose, the tips of its bracts somewhat callose, a few sometimes with small, corniculate appendages. Flowers dark yellow; pollen present. Fruits straw-coloured.

In dry turfy places.

General distribution: A high-arctic, little-known, and rarely collected species endemic to the Arctic Archipelago and Northern Greenland. FIG. 69,c. MAP 330.

5. **T. phymatocarpum** J. Vahl—A slender, delicate, dwarf species with narrow, subentire, dark green leaves. Scapes usually solitary, rarely 2 or 3 from each root, purple, slender and weak, often decumbent or reclining. The flowering heads narrow and turbinate, remaining closed during anthesis. Involucres bluish-black, pruinose. Flowers lemon-yellow; pollen present. Fruit dark olivaceous, muricate.

Stony and gravelly places, usually in mineral soil.

General distribution: N. America, high-arctic, widely distributed; arctic Eurasia. FIG. 69,d. MAP 331.

13. CREPIS L. Hawk's beard

C. nana Richards.—Tufted dwarf perennial with a strong tap-root terminating in a depressed leafy rosette of dark purplish, slender petioled leaves; the blade entire, crenulate, or somewhat runcinate, oval-lanceolate, usually about 1 cm. long. The small yellow heads crowded among the leaves.

Dry, calcareous screes or gravel.

General distribution: Asia and N. America, arctic-alpine. FIG. 70,c. MAP 332.

BOTANICAL VOCABULARY

Acaulescent. Stemless or appearing so, or with the stem wholly subterranean.
Achene. A small, nut-like fruit as in the separate fruits of a buttercup.
Acidophilous. Acid loving.
Actinomorphy. Arrangement of parts of flower in radial symmetry.
Acuminate. Tapering gradually to a sharp point.
Adventitious. Not in the usual place.
Adventive. Not fully established or only locality established.
Alternate. Not opposite: singly at each node.
Ament. A catkin or a dry, scaly spike such as the inflorescence of willow.
Amphibious. Equally well adapted to life in water and on dry land.
Annual. Of one year's duration.
Anther. The pollen-bearing part of a stamen.
Anthesis. Period during which a flower is fully expanded or functional.
Apogamy. The development of fruits without fertilization, i.e. parthenogenesis.
Apomictic. Parthenogenetic; reproducing seeds without fertilization.
Appressed. Lying close or flat against a surface.
Approximate. Close together.
Arachnoid. Cobwebby.
Arcuate. Curved into arcs of a circle, without regard to direction.
Argillaceous. Of a clayey nature.
Aristate. Having an awn.
Article. Part of a fruit separated from others by a constricted joint.
Ascending. Rising obliquely.
Attenuate. Gradually tapering.
Auricle. An ear-shaped appendage.
Awl-shaped. Tapering gradually upward to a sharp, rigid point.
Awn. A bristle-shaped appendage.
Axil. The angle between leaf and stem.
Axillary. Growing in an axil.
Axis (pl. *axes*). The central or longitudinal support of organs such as flowers in an inflorescence.

Beaked. Ending in a prolonged tip.
Biennial. Of two years' duration.
Bipinnate. Doubly or twice pinnate.
Bisexual. With both stamens and pistils.
Bract. A usually modified leaf subtending a flower or inflorescence.
Bulbil. A small bulb or adventitious bud.

Caducous. Falling off early.
Caespitose. Forming tufts or mats.
Calcareous. Of soil rich in lime.
Calcicole. Of a plant growing by preference on soil rich in lime.
Calciphile. Plant addicted to calcareous soil.
Calciphilous. Lime-loving.
Callose. Hardened or thickened.
Campanulate. Bell-shaped.
Canaliculate. Channelled longitudinally.
Canescent. Hoary with grey pubescence.
Capillary. Hair-like.
Capitate. Head-like, or shaped like a head.
Capsule. A dry, dehiscent fruit composed of several carpels.
Carpel. A simple pistil, or a member of a compound pistil.
Castaneous. Of chestnut colour.
Catkin. An ament, or dry, scaly, spike-like inflorescence, as in willow.
Caudex. The persisting base of an otherwise annual or herbaceous plant.
Cauline. Belonging to the stem.
Channelled. Grooved longitudinally.
Cilia. Marginal hairs.
Ciliate. Fringed with long hairs.
Cinereous. Ash-coloured.
Clavate. Club-shaped.
Clasping. Partly embracing another organ at base.
Claw. The narrow base of some petals.
Cleft. Deeply cut or lobed.
Compound. Formed of two or more similar parts.
Convolute. Rolled longitudinally.
Cordate. Heart-shaped.
Corniculate. Horned or provided with horn-like appendages.
Corymb. Type of raceme in which the axis is short and the lower pedicels relatively long, producing a round- or flat-topped inflorescence.
Corymbiform. Shaped like a corymb.
Cotyledon. The leaf of the embryonic plant within the seed. The first leaves to appear when the seed germinates; usually differing in shape from later leaves. In some species the cotyledons remain within the seed coat.
Crenate. A toothed margin in which the teeth are rounded or blunt.
Cruciform. Forming a cross.
Cryptogams. Plants lacking true flowers and fruits, such as ferns, mosses, etc.
Culm. The stem of grasses or sedges.
Cuneate. Wedge-shaped; narrowly triangular with the acute angle pointed downward.
Cuspidate. Tipped with a sharp cusp or point.

Deciduous. Not persisting; not evergreen.
Decumbent. Declining but with an ascending summit.
Deflexed. Bent abruptly downward.
Dehiscence. The process or act of opening, usually in a fruit.

Dentate. Toothed.
Depressed. Flattened.
Dichotomous. Forking regularly into two branches of equal size.
Diffuse. Loosely spreading.
Digitate. Fingered.
Dimorphic. Occurring in two forms.
Dioecious. Unisexual, with male and female flowers appearing on separate plants or in separate parts of the inflorescence.
Discoid. Disk-like; in *Compositae* of a head without ray-flowers.
Disk flowers. In *Compositae* the tubular flowers in a head.
Distinct. Separate, not united.
Divaricate. Widely spreading from the axis or rachis.
Dorsal. Belonging to the back of an organ.
Downy. Pubescent with soft, fine hairs.
Drupe. A fleshy fruit containing one or several hard and stony seeds.

Emarginate. Notched at the apex.
Emergent. Of water plants only partly submersed.
Endemic. Confined geographically to a single area.
Entire. Without indentations or division.
Epidermis. The superficial layer of cells.
Erect. Growing essentially in a vertical position.
Erose. With the margin as if gnawed.
Evergreen. Remaining green throughout the winter.
Exsert. Project beyond; often referring to stamens or styles from a corolla.

Fascicle. A bundle.
Feather-veined. With bilateral veins proceeding from a midrib.
Fertile. Capable of normal reproductive functions.
Fibrous. Resembling fibres.
Filament. The part of a stamen bearing the anther.
Filiform. Thread-like.
Fimbriate. Fringed.
Flabellate or *flabelliform.* Fan-shaped.
Flaccid. Lax and weak.
Fleshy. Thick and juicy; succulent.
Flexuous. Curved alternately in opposite directions.
Floccose. Irregularly covered by tufts or flocks of soft hair or wool.
Floret. A small flower, usually one of several in a cluster.
Floriferous. Flower-bearing.
Foliose. Leafy.
Follicle. A fruit consisting of a single carpel dehiscing by the ventral suture.
Forked. Divided into equal branches.
Free. Not adnate to other organs.
Frond. The leaf-like part or thallus of a fern or fern-like plant.
Fruit. The seed-bearing part of a plant.
Fruticose. Shrub-like.

Gamopetalous. Having the petals wholly or partly united.
Glabrate. Essentially without pubescence, or becoming glabrous.
Glabrous. Lacking pubescence; smooth.
Glandular. Bearing glands.
Glaucous. Covered or whitened with a bloom.
Glomerate. Compactly clustered.
Glomerule. A small cluster.
Glume. A chaff-like bract; in grasses the two empty bracts at the base of a spikelet.
Glutinous. Covered with a sticky substance.

Habit. The general appearance of a plant.
Habitat. The kind of place in which a plant grows, such as bogs, woods, etc.
Hair. An epidermal appendage, usually slender, simple, or variously branched.
Halophyte. Plant adapted to growth in saline soil.
Hapaxanthic. Flowering but once.
Herb. A plant dying back to the ground at the end of the growing season.
Hermaphrodite. With stamens and pistils in the same flower (a perfect flower).
Hirsute. Hairy with soft hairs.
Hispid. Provided with bristly hairs.
Hoary. Greyish-white, close pubescence.
Humifuse. Spreading over the ground.
Hybrid. A cross between two species.
Hypanthium. An enlargement of the receptacle under the calyx, forming a saucer-shaped, cup-shaped, or tubular organ.
Hypogynous. Appearing on the receptacle beneath the ovary and free from it or from the calyx; term usually applied to petals and stamens.

Imbricate. Overlapping.
Immersed. Growing completely under water.
Incised. Cut sharply and irregularly.
Indehiscent. Not opening at maturity.
Indument. Any kind of hairy covering or pubescence.
Incurved. Curved inward.
Indusium. The (usually) shield-like cover of the sorus in ferns.
Inferior. Lower or below; of ovary when adnate to the calyx.
Inflorescence. The flowering part of a plant.
Innovation. An offshoot usually from the base of a stem.
Internode. The part of a stem between two nodes.

Involucre. The row of bracts surrounding a single flower, a cluster of flowers, or a head.

Involucel. Diminutive of involucre.

Involute. Rolled inward.

Inserted. Attached to or growing out of.

Irregular. Of flower composed of parts dissimilar in form or size.

Keel. The two lowermost and united petals in a papilionaceous flower. A dorsal longitudinal ridge.

Lacerate. Irregularly cleft as if torn.

Lacinate. Deeply cut into narrow segments.

Lacustrine. Living in lakes.

Lanate. Woolly.

Lanceolate. Shaped like the head of a lance; broadest near the base, narrowing toward the apex.

Lateral. Situated or arising on the side of an organ.

Latex. The milky juice of some plants.

Leaflet. A single division of a compound leaf.

Legume. The fruit of *Leguminosae.*

Lemma. The lower of the two bracts enclosing the grass flower.

Ligneous. Woody.

Ligulate. Provided with a ligule.

Ligule. The strap-like limb of the marginal flower in *Compositae*; the flat, usually membranaceous projection from the summit of the sheath in grasses.

Limb. The expanded part of a gamopetalous corolla; the expanded part of any petal or leaf.

Linear. Narrow and parallel-margined.

Lip. The upper or lower division of a bilabiate corolla.

Litoral or *littoral.* Growing on seashores.

Lobe. A segment of an organ, especially if rounded.

Locule. The cavity of an ovary or anther.

Loment. A legume composed of one-seeded articles.

Lyrate. Of pinnatifid leaf in which the terminal lobe is large and rounded and the lower and lateral lobes are small.

Marcescent. Withering, but persisting for several years.

Membranaceous. Thin and more or less transculent.

Midrib. The median or central rib of a leaf.

Moniliform. Resembling a string of beads.

Monoecious. With stamens and pistils in separate flowers but in the same plant.

Mucro. A small, abruptly pointed tip.

Mucronate. Tipped with a mucro.

Muricate. Rough with short, sharp points.

Naked. Lacking various organs or appendages, especially when such are usually present in similar species or parts.

Nerve. A vein or slender rib.

Node. The solid constriction in the culm of a grass; places on a stem where a leaf or a whorl of leaves is attached.

Nut. A hard, indehiscent 1-seeded fruit.

Obcordate. Inverted heart-shaped.

Oblanceolate. Lanceolate with the broadest part above the middle.

Obtuse. Blunt.

Offset. A short prostrate or ascending shoot, usually propagative in function, arising near the base of a plant.

Opposite. Situated diametrically opposite to each other at the same node.

Oval. Broadly elliptic.

Ovule. The young seed in the ovary, which, after fertilization, develops into a seed.

Oxylophyte. Plant adapted to, or preferring, acid soil.

Palea or *palet.* The tiny upper bract that with the lemma encloses the grass flower.

Palmate. Radiately divided.

Panicle. A compound or branched inflorescence of the racemose type.

Pannose. With the texture of felt.

Papilionaceous. Having the structure of a typical flower of the pea family.

Papillose. Beset with minute nipple-shaped processes.

Pedicel. The stem or support of a single flower.

Peduncle. A primary flower-stalk supporting either a cluster or a solitary flower.

Pendulous. Hanging or declined.

Perennial. Of several or many years' duration.

Perfect. Of a flower having both stamens and pistil.

Perianth. The floral envelope, consisting of calyx and corolla.

Perigynium. The inflated sac enclosing the ovary in *Carex.*

Persistent. Long-continuous, as the calyx upon some fruits, or leaves lasting through the winter, etc.

Petal. A division of the corolla.

Petiole. Leaf-stalk.

Phanerogam. A plant reproducing by flowers and seeds.

Pilose. Hairy with soft hairs.

Pinna (pl. *pinnae*). One of the primary divisions of a pinnate or compoundly pinnate leaf.

Pinnate. Of a compound leaf in which the leaflets appear on each side of the common axis.

Pistil. The seed-bearing organ of a flower consisting of ovary, stigma, and (when present) style.

Pistillate. Usually of flowers containing only the female parts.

Placenta. The part of the ovary bearing the ovules.

Plumose. Feathery.

Pollen. The fertilizing, powder-like substance produced by the anthers in phanerogams.

Polygamous. With hermaphrodite and unisexual flowers on the same or on different individuals of the same species.

Polymorphous. Variable as to form or habit.

Procumbent. Declining but not rooting at the nodes.

Proliferous. Reproducing freely by offsets, bulbils, or other vegetative means.

Prostrate. Lying flat on the ground.

Pruinose. With a powdery, waxy secretion on the surface, i.e. a "bloom".

Pubescence. Hair-cover, without reference to structure.

Pubescent. Hairy, especially with short, soft hairs.

Pulvinate. Cushion-shaped.

Quinate. Five-parted.

Raceme. A simple inflorescence of pedicellate flowers on a common, more or less elongated axis; the lowest flowers opening first.

Rachilla. A small rachis; specifically the rachis of a spikelet in grasses or sedges.

Rachis. The axis of an inflorescence or of a compound leaf.

Radiant. Radiating from a central point.

Ray. The ligule or strap-like marginal flower in *Compositae.*

Receptacle. The expanded part of an axis bearing the organs of a flower.

Regular. Uniform or symmetrical in structure or form.

Reniform. Kidney-shaped.

Repand. With a shallowly sinuate margin.

Repent. Creeping or prostrate and rooting at the nodes.

Reticulate. Net-veined.

Retrorse. Directed downward or backward.

Retuse. With a shallow notch in an otherwise rounded tip.

Revolute. Rolled backward from the margins.

Rhizome. An underground, usually horizontal stem emitting roots from the underside and leafy stems from the upper, and upturned at the tip.

Rib. A primary and prominent vein of a leaf.

Rosette. A circular cluster of leaves.

Rootstock. Equals rhizome.

Rostrate. Beaked.

Rosulate. In the form of a rosette.

Rugose. Wrinkled.

Runcinate. Sharply incised with the segments directed backwards.

Runner. A very slender stolon.

Saccate. Purse- or sac-shaped.

Sagittate. Shaped like an arrow-head.

Scale. A thin, scarious body, usually a degenerate leaf, or sometimes of epidermal origin.

Scape. A naked flowering stem rising directly from the ground.

Scapose. Bearing or resembling a scape.

Scarious. Thin, dry, and membranaceous, not green.

Scattered. Irregularly arranged.

Scurfy. Covered with scale-like particles.

Seed. The ripened ovule, consisting of the embryo and its several coats.

Sepal. A division of the calyx.

Septate. Divided repeatedly by partitions.

Septum. A partition within an organ, as in the silique in *Cruciferae.*

Sericeous. Silky.

Serrate. Having sharp, forward-pointed teeth, as in a saw.

Serrulate. Finely serrate.

Sessile. Without a stalk.

Seta. A bristle.

Setaceous or *setose.* Bristle-shaped, or provided with bristles.

Sheath. A tubular envelope such as the lower part of the leaf in grasses.

Silicle. A short silique.

Silique. The peculiar 2-locular pod of the *Cruciferae,* opening by two valves falling away from a frame on which the seed grows, and across which a partition (septum) is formed.

Sinus. The cleft between two lobes.

Snowbed and *Snowpatch.* Ecological terms explained on p. 6, under Soils and Plant Habitats.

Sorus (pl. *sori*). Term applied to the fruit-dots of ferns.

Spatulate. Oblong and narrowing at the base.

Spermatophyte. A phanerogam; a plant reproducing by true seeds.

Spicate. Arranged in spikes.

Spike. An inflorescence with sessile flowers along a common, elongated axis.

Spikelet. A small or secondary spike subtended by a common pair of glumes or bracts as in grasses.

Sporadic. Occurring here and there without continuous range.

Sporangium. A spore-case.

Spore. The reproductive organ in cryptogams corresponding to the seed in spermatophytes but containing no embryo.

Sporophyll. A special organ for the production of spores.
Spur. The hollow, sac-like or tubular extension from the base of a petal in certain flowers.
Stamen. The pollen-bearing organ of a flower, consisting of filament and anther.
Staminodium or *staminode.* A sterile structure occupying the position of a stamen.
Standard. The upper, dilated petal in the flower of members of the pea family.
Station. A particular locality for a given plant.
Stellate. Sessile or short-stalked, star-shaped hairs.
Stem. The main ascending axis of a plant, as contrasted to the root and leaf.
Sterile. Unproductive.
Stigma. The part of the pistil that receives the pollen.
Stigmatic. Of the characteristic of a stigma.
Stipe. A stalk-like support; the "leaf-stalk" of a fern; the support of a pistil.
Stipitate. Having a stipe.
Stipule. Appendage at the base of a petiole.
Stolon. A runner, or any prostrate branch that is disposed to root.
Stramineous. Straw-coloured.
Striga. A small, straight, appressed hair-like scale.
Strigose. Beset with such small, straight appressed hairs.
Strobile. An inflorescence resembling a spruce or fir cone, partly made up of imbricated scales.
Style. The attenuated part of a pistil connecting the stigma to the ovary.
Sub-. A Latin prefix usually signifying "somewhat" or "slightly".
Subulate. Awl-shaped.
Superior. Of an ovary occupying a terminal or central position in the flower above the receptacle, and not adnate to the calyx.
Suffrutescent. Slightly shrubby.
Synonym. A superseded or obsolete name.

Tap-root. A primary, descending root.
Taxonomy. Classification.
Terete. Circular in cross-section.
Ternate. Three-parted.
Thallus. A vegetative body without differentiation into stem and leaf, usually lacking roots.
Tomentose. Densely pubescent with matted wool.
Tomentum. Densely intertwined woolly hair.
Torose or *torulose.* Cylindrical with contractions at regular intervals.
Torus. Equals receptacle.
Trailing. Prostrate but not rooting.
Trichome. A hair-like outgrowth of the epidermis.
Truncate. Ending abruptly, as if cut off transversely.
Tuber. A rootless, thickened and short subterranean organ serving for food storage and also for propagation.
Turbinate. Top-shaped; inversely conical.
Type or *type specimen.* In taxonomy, the specimen from which the original description was drawn.

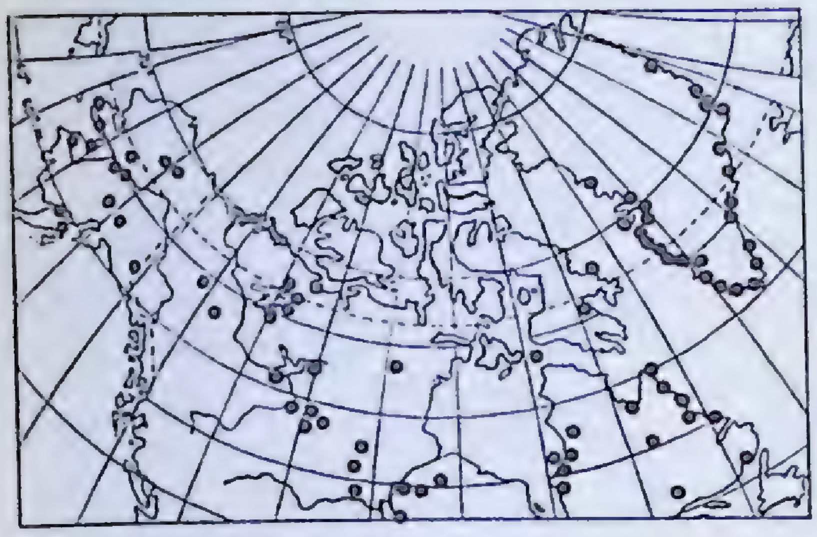
Umbel. An inflorescence in which the pedicels spring from the same central level.
Umbelliform. In the shape of an umbel.
Undulate. A wavy surface or margin.
Unisexual. Of flowers bearing stamens or pistils, but not both.
Urceolate. Urn-shaped; a cylindrical or ovoid vessel contracted at or below the mouth.
Utricle. A small bladdery sac enclosing an achene, as in *Carex;* any bladder-like appendage.

Valvate. Opening by valves.
Valve. One of the pieces into which a capsule splits.
Vascular. Having vascular bundles or ducts.
Ventral. Belonging to the anterior or inner face of an organ.
Verrucose. Warty; covered by low, rounded processes.
Verticil. A whorl of leaves or flowers.
Verticillate. Arranged in a whorl.
Vexillum. The standard or large posterior petal in flowers of the pea-family.
Villous or *villose.* Hairy with long, soft, but not matted hairs.
Viscid. Glutinous; sticky.
Viviparous. Of adventitious buds sprouting or germinating on the parent plant.

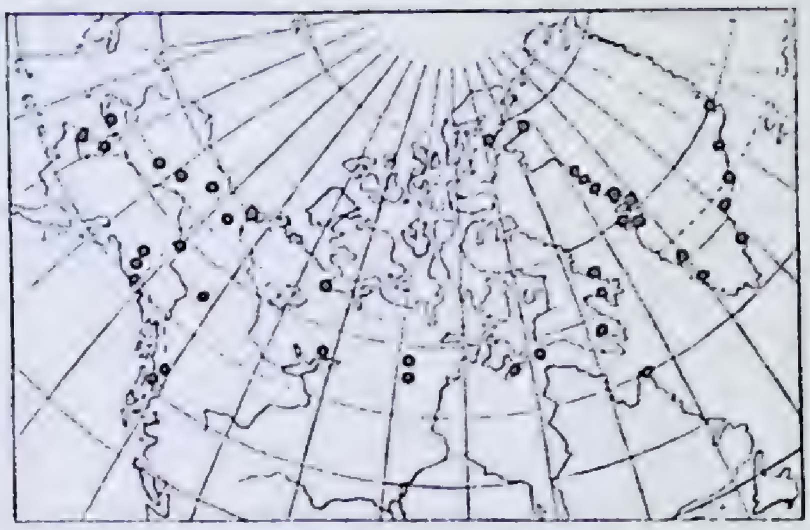
Whorl. Leaves, etc. arranged in a circle around the stem.
Wing. A flat structure emerging from the side of an organ; in a papilionaceous flower the lateral and similar petals.
Winter bud. A shortened and crowded, hibernating vegetative shoot.

Xerophyte. A plant of arid habitats.

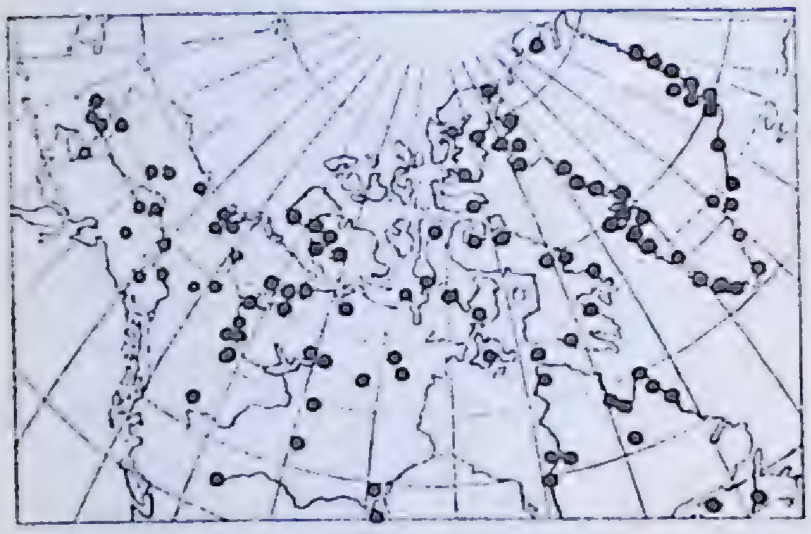
Zygomorphy. The type of symmetry found in most irregular flowers; the upper half unlike the lower, the left half a mirror image of the right.



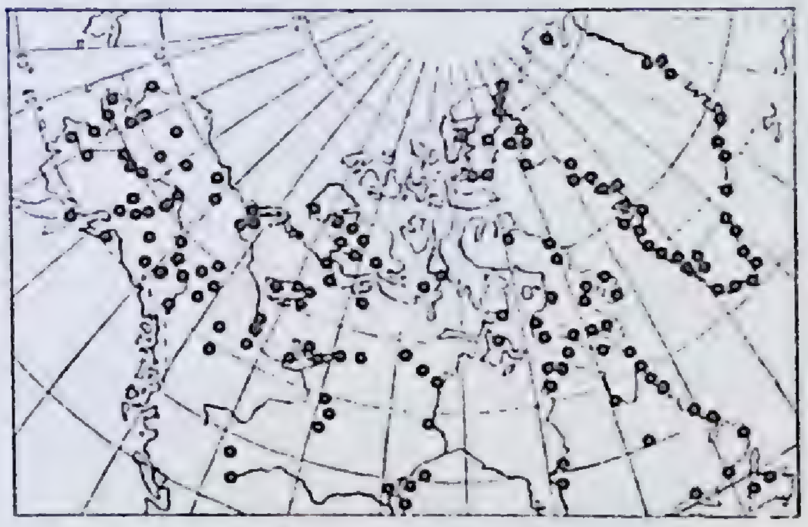
1. *Woodsia ilvensis*



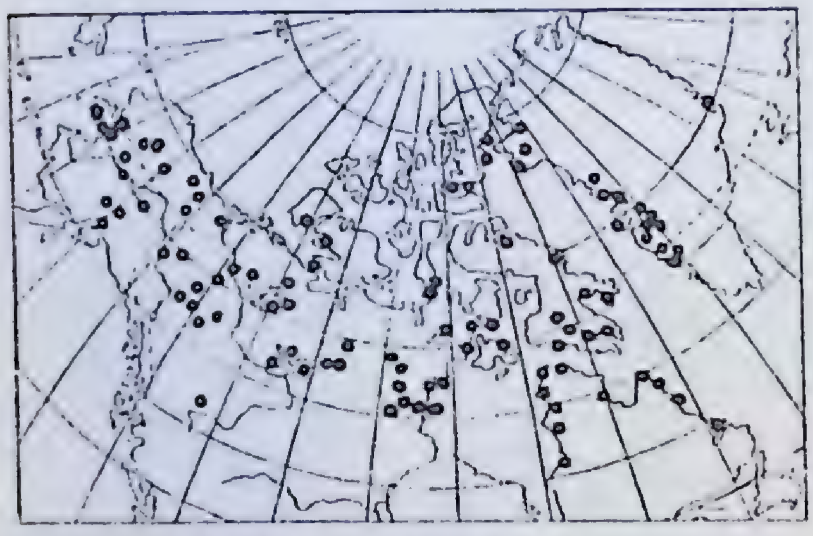
2. *Woodsia alpina*



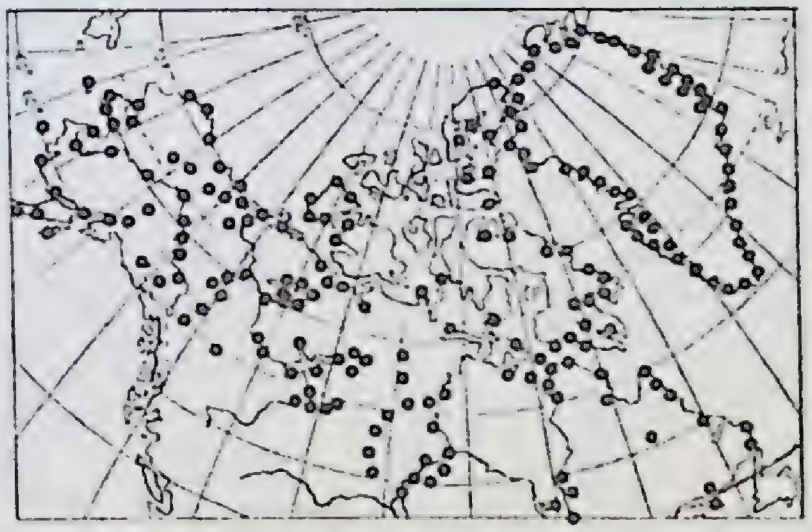
3. *Woodsia glabella*



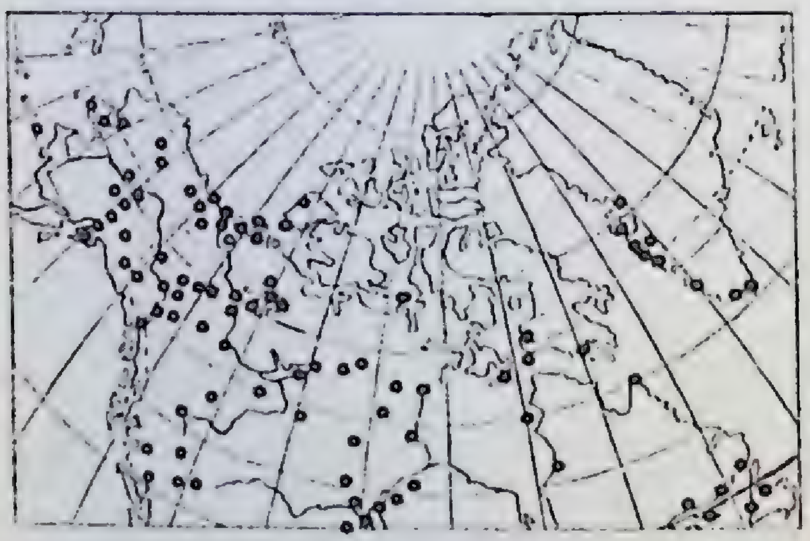
4. *Cystopteris fragilis*



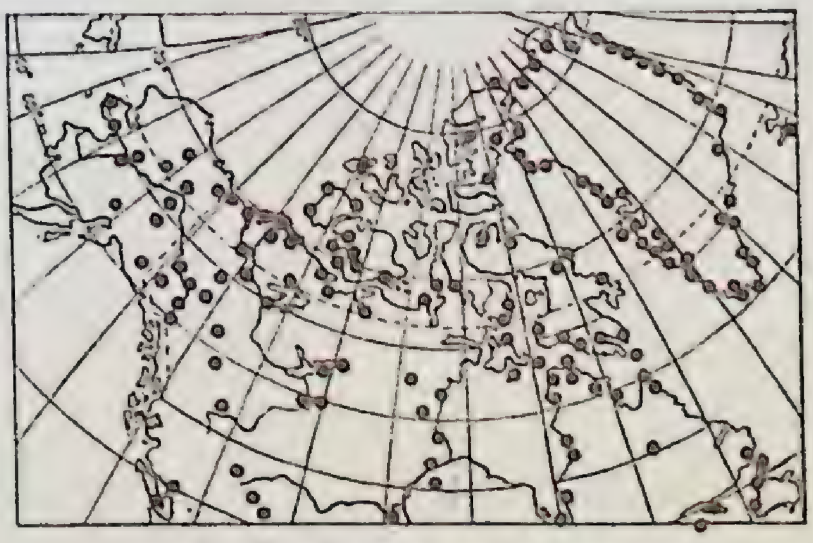
5. *Dryopteris fragrans*



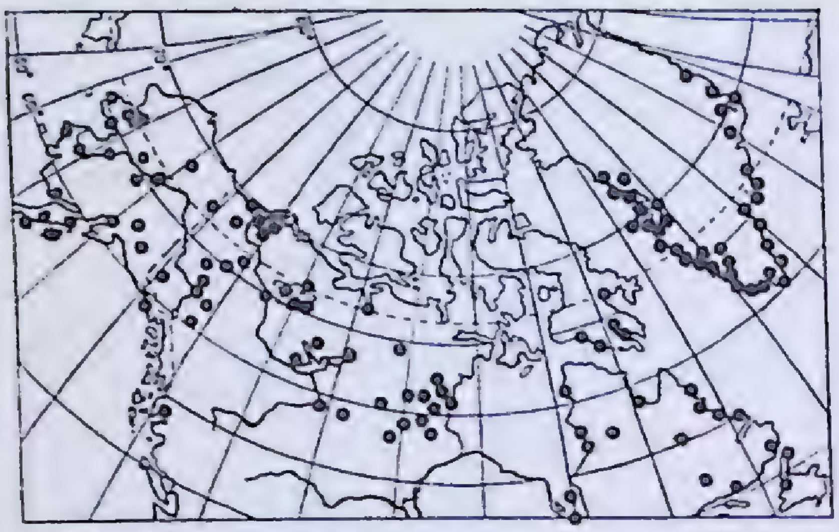
6. *Equisetum arvense*



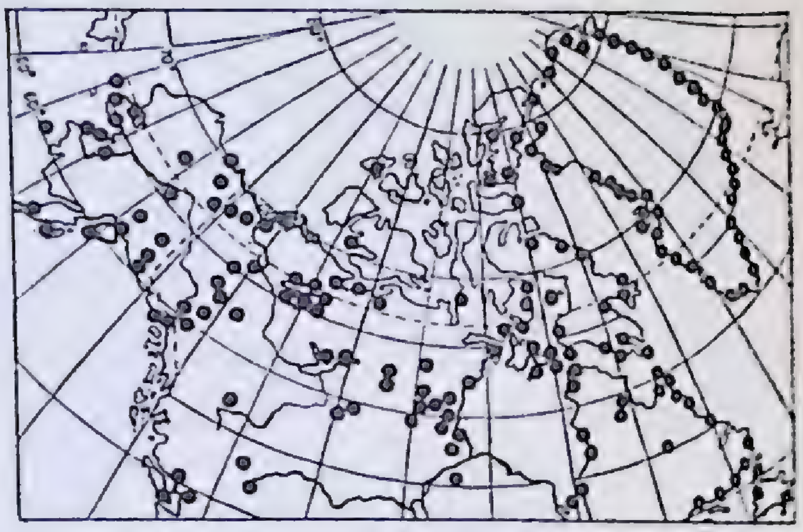
7. *Equisetum scirpoides*



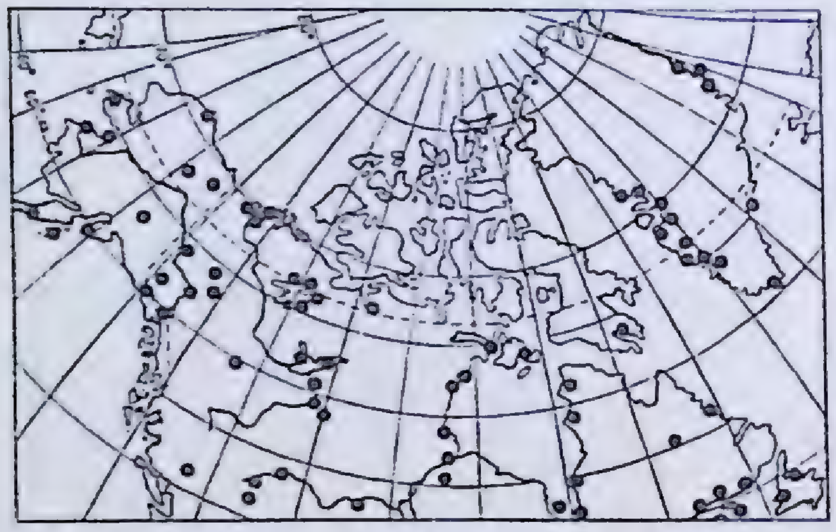
8. *Equisetum variegatum*



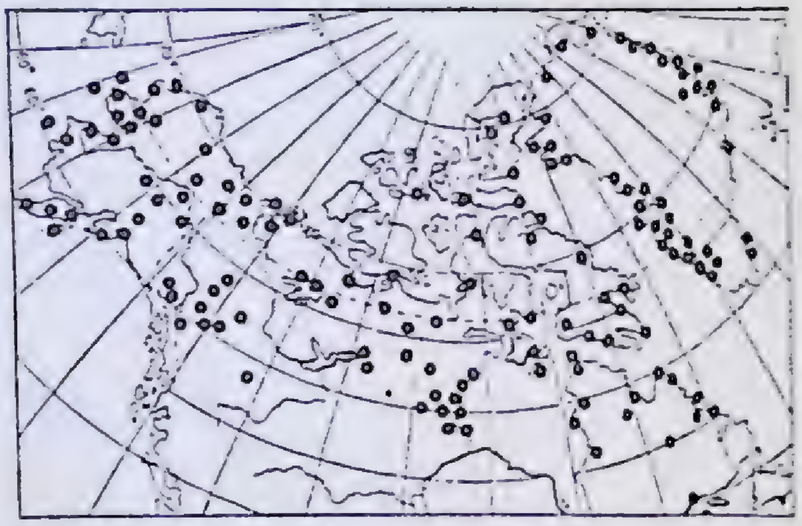
9. *Lycopodium annotinum* var. *pungens*



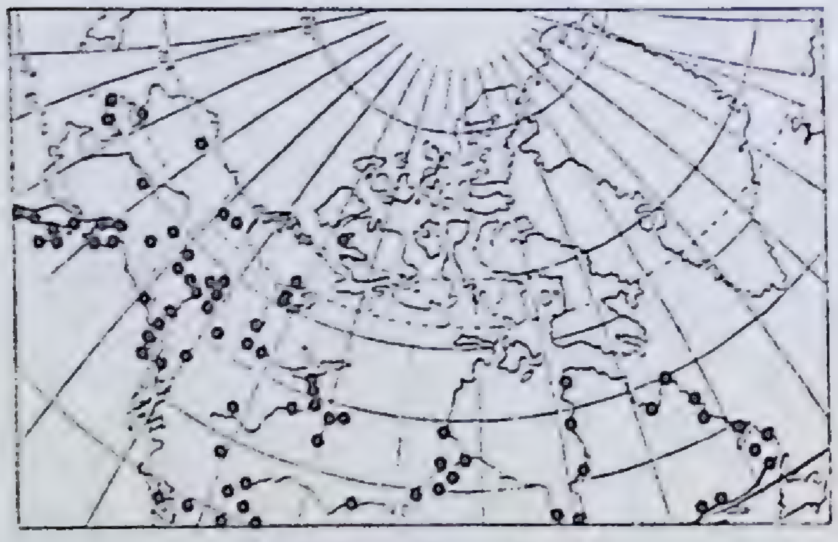
10. *Lycopodium Selago*



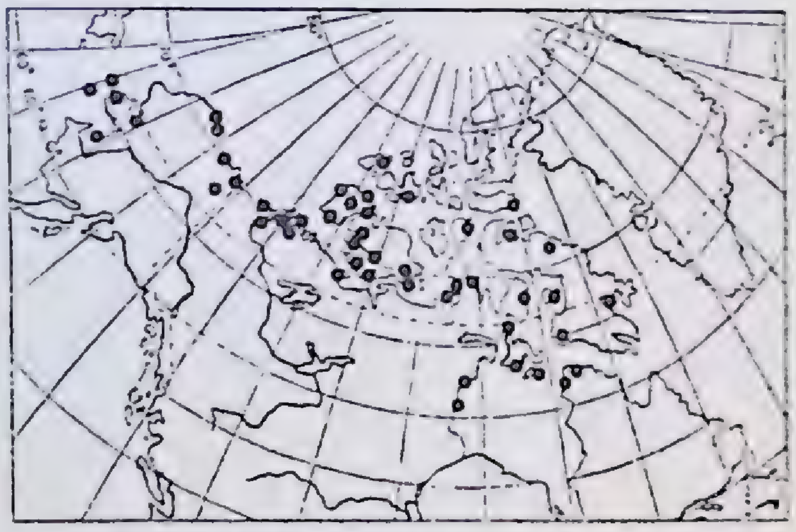
11. *Potamogeton filiformis* var. *borealis*



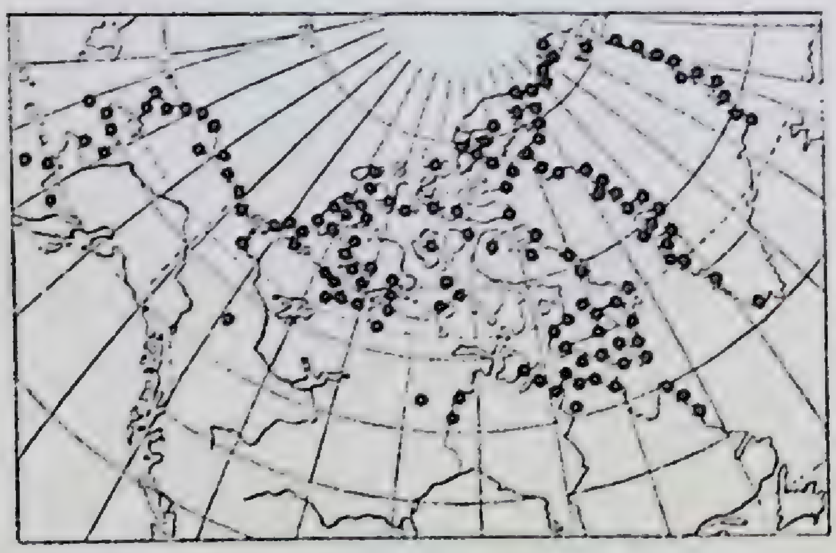
12. *Hierochloe alpina*



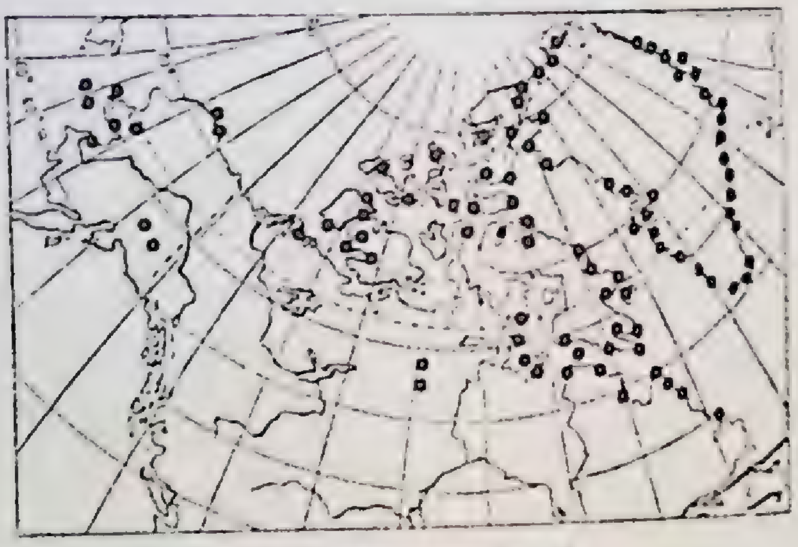
13. *Hierochloe odorata*



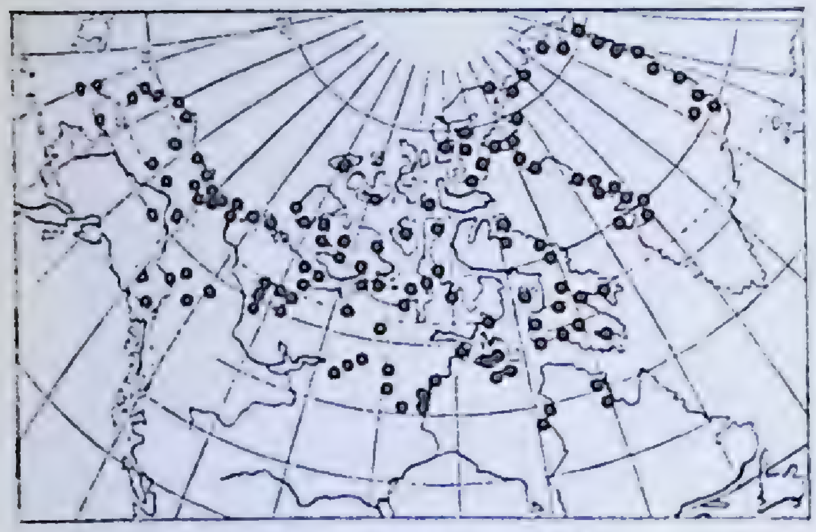
14. *Hierochloe pauciflora*



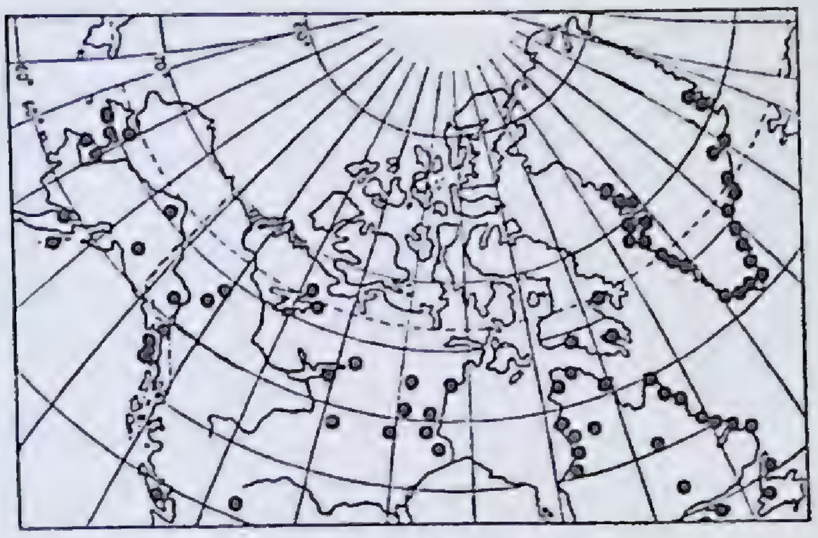
15. *Alopecurus alpinus*



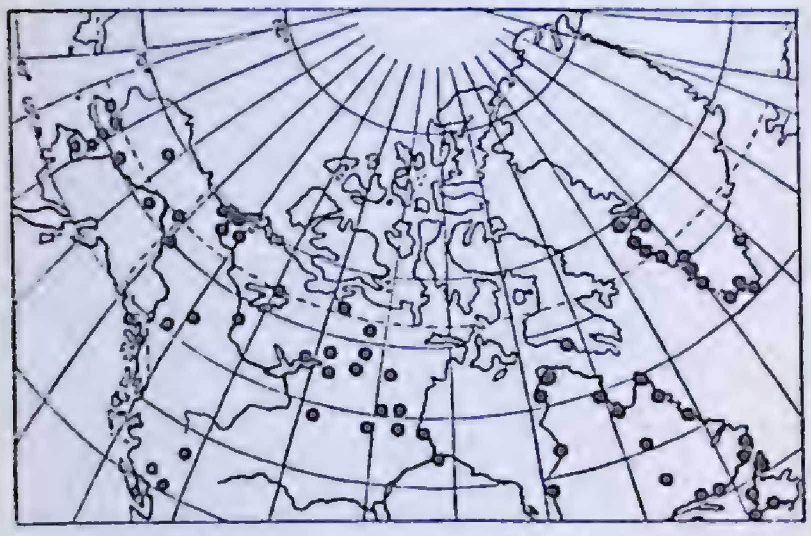
16. *Phippsia algida*



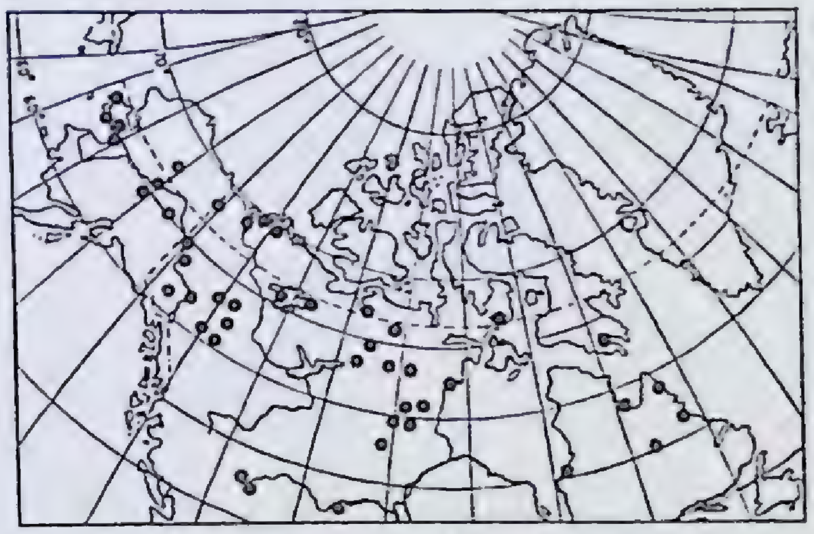
17. *Arctagrostis latifolia*



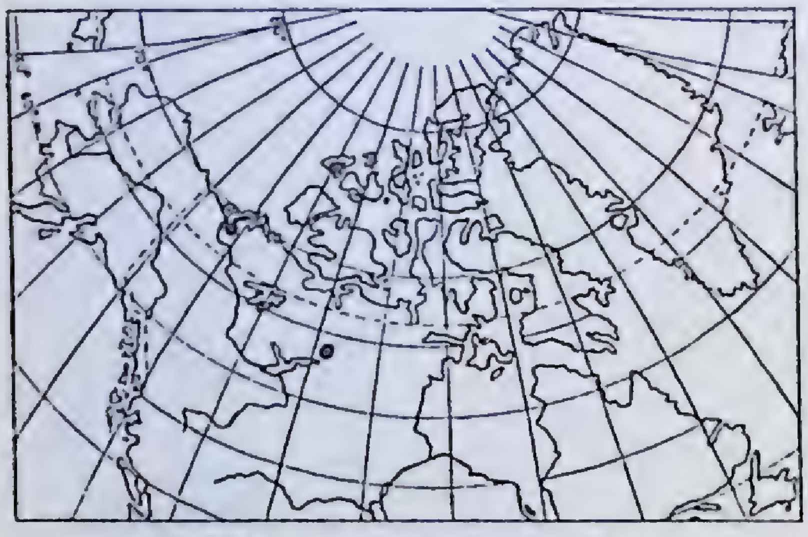
18. *Agrostis borealis*



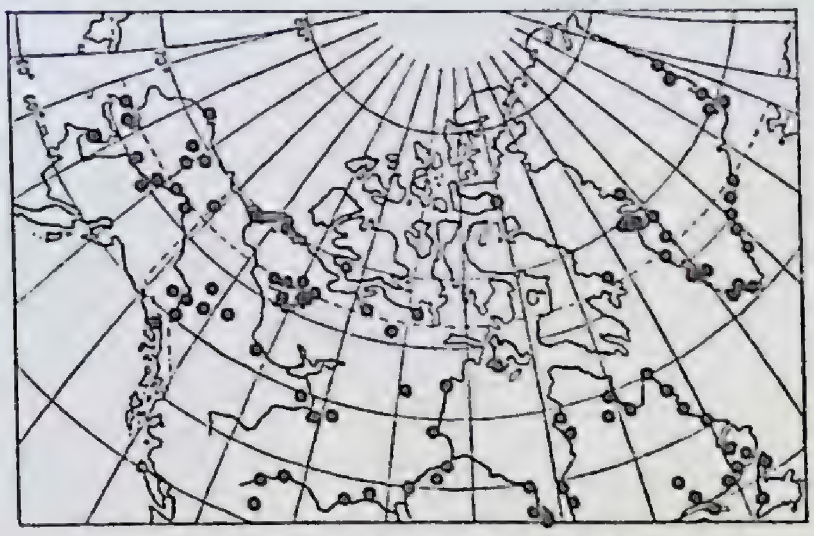
19. *Calamagrostis canadensis* var. *Langsdorffii*



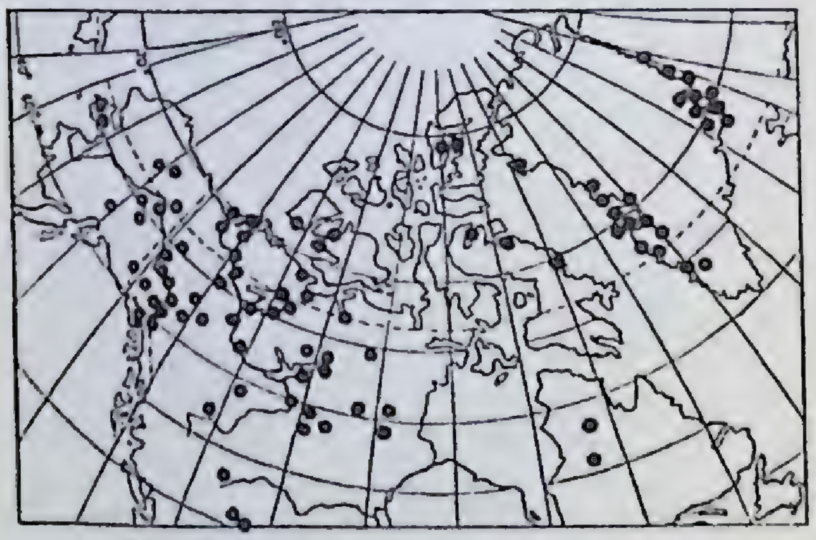
20. *Calamagrostis lapponica* var. *nearctica*



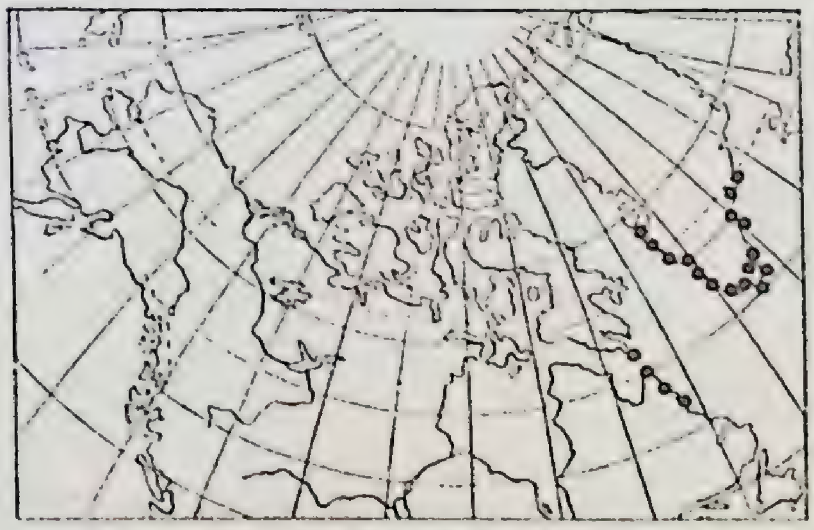
21. *Calamagrostis chordorrhiza*



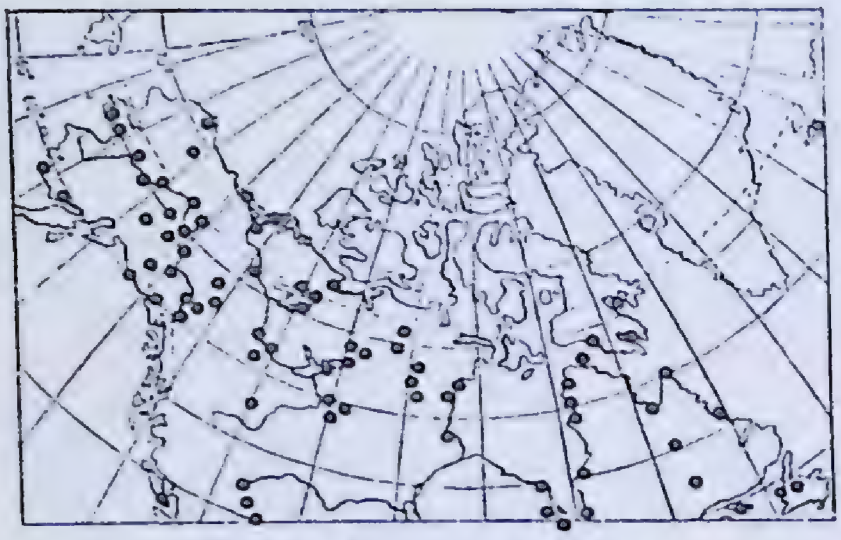
22. *Calamagrostis neglecta*



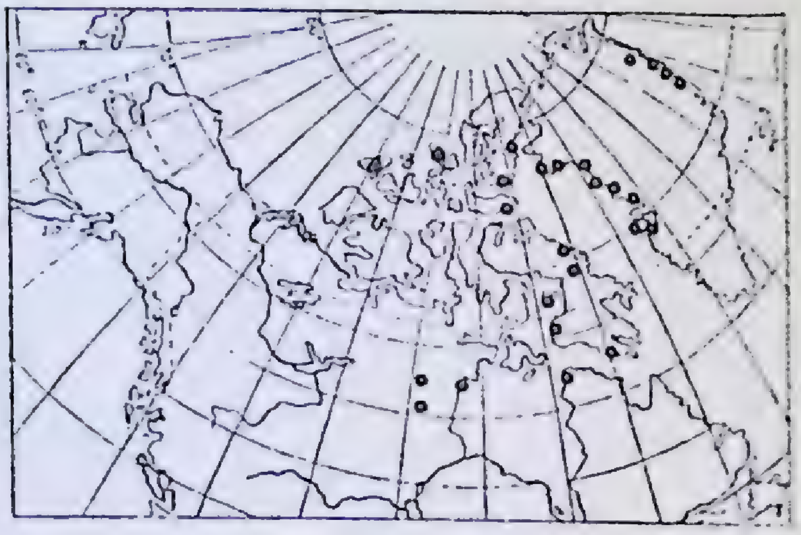
23. *Calamagrostis purpurascens*



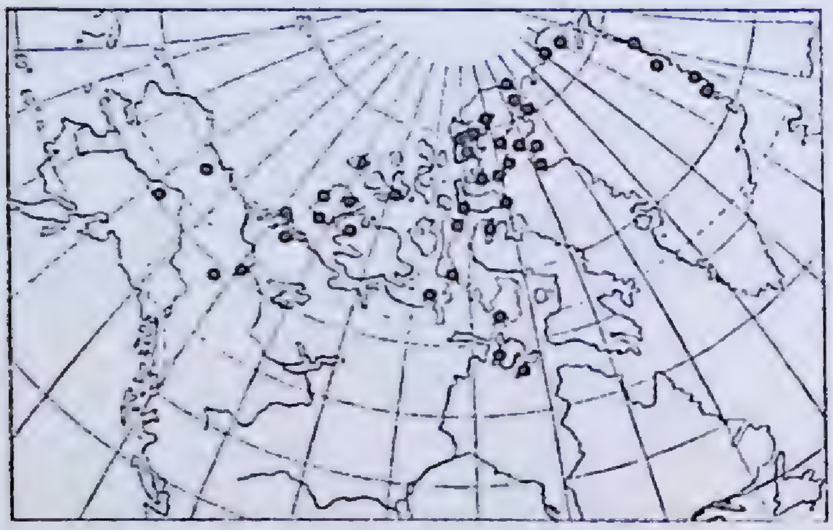
24. *Deschampsia alpina*



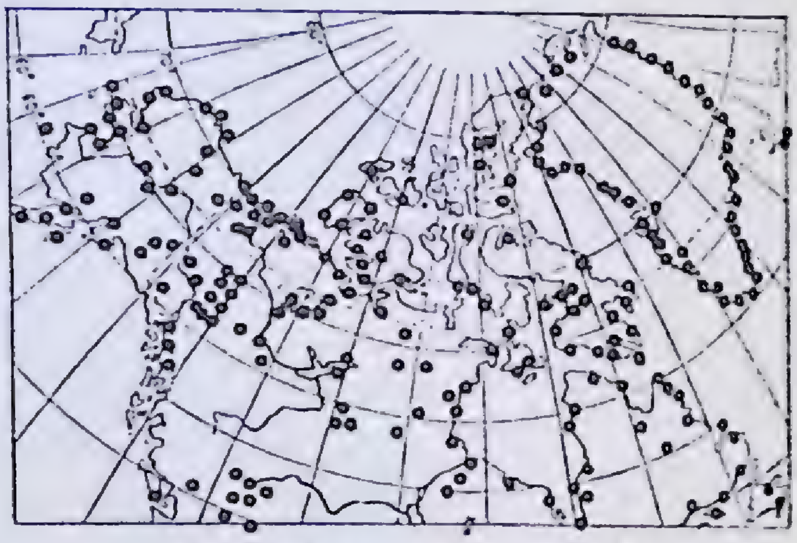
25. *Deschampsia caespitosa*



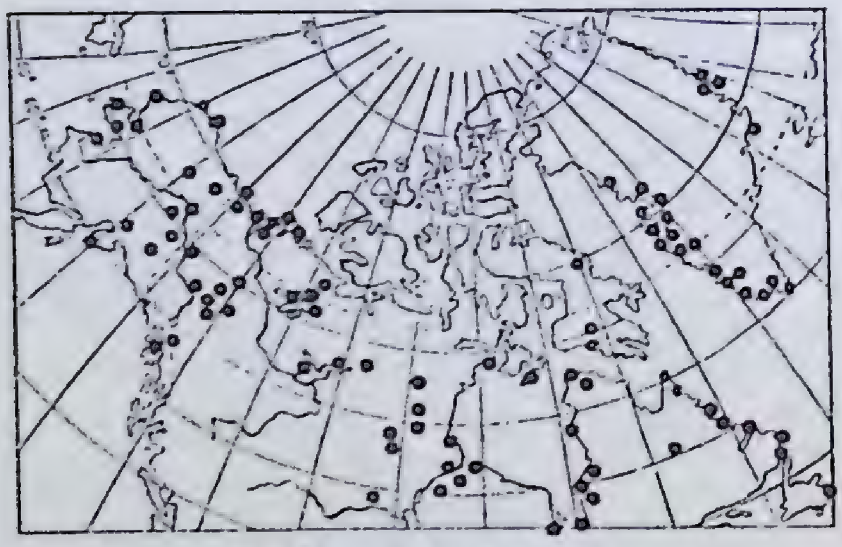
26. *Deschampsia pumila*



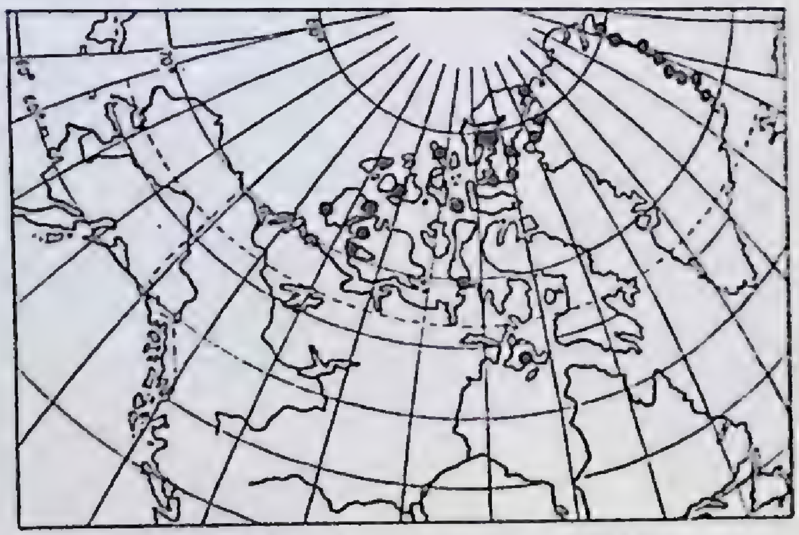
27. *Deschampsia brevifolia*



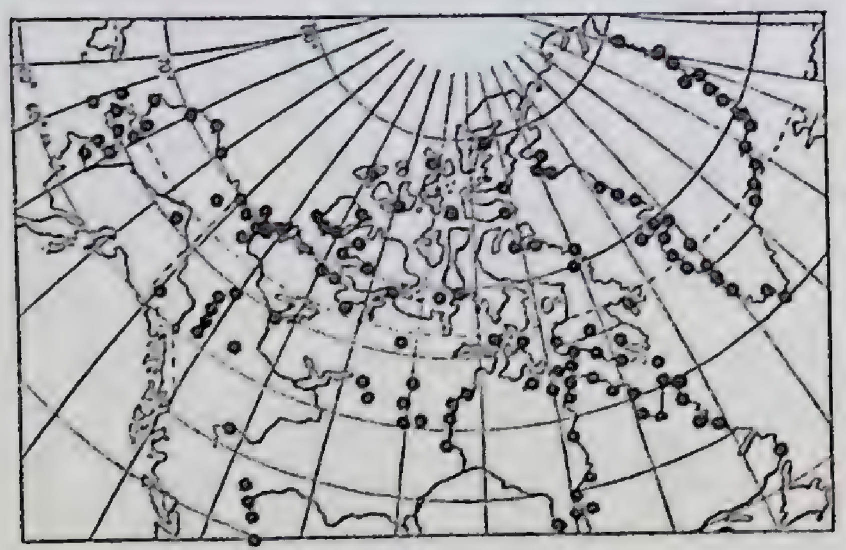
28. *Trisetum spicatum* s. lat.



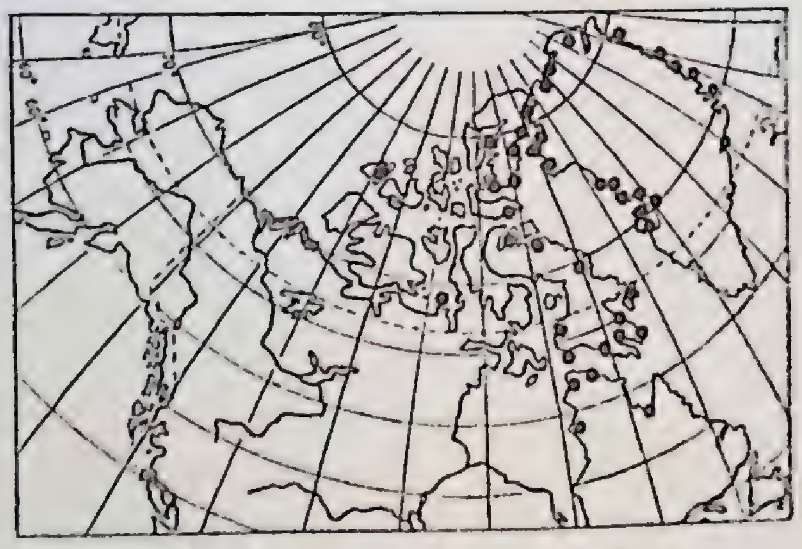
29. *Poa alpigena* s. str.



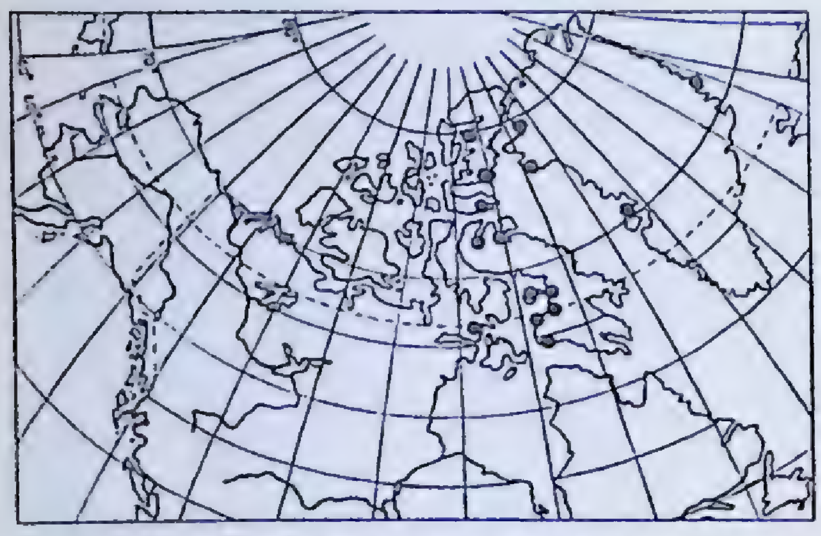
30. *Poa alpigena* var. *colpodea*



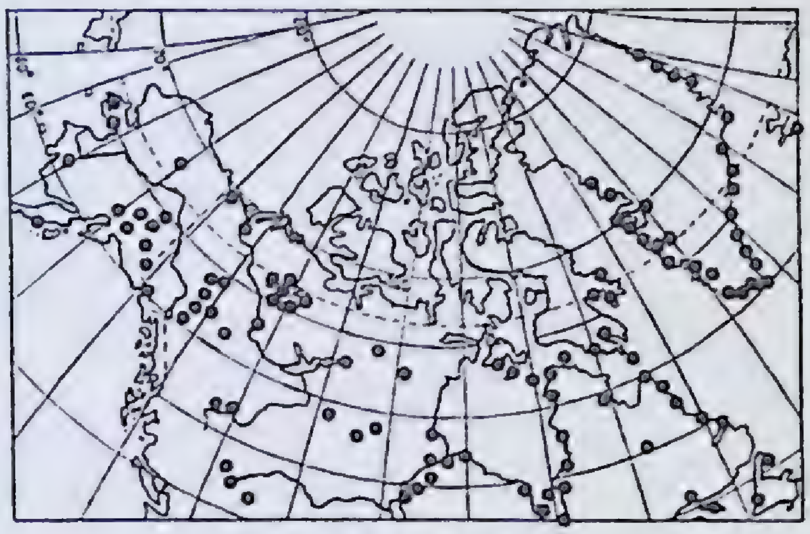
31. *Poa arctica*



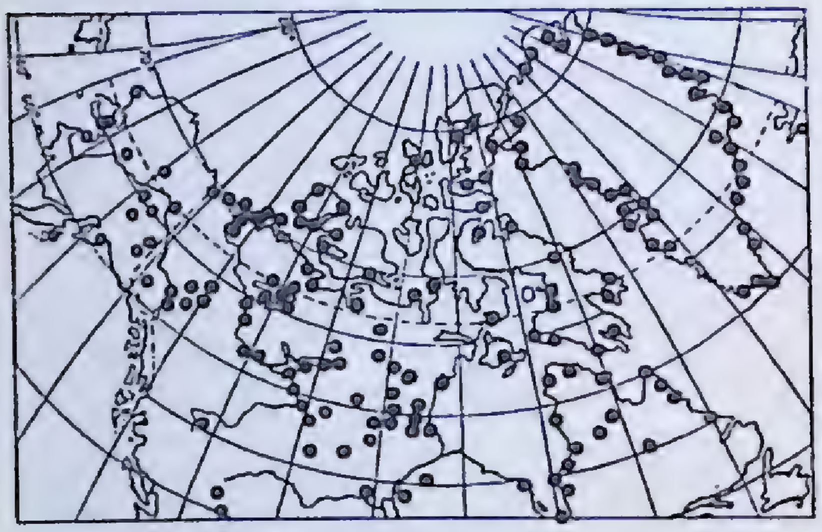
32. *Poa arctica* ssp. *caespitans*



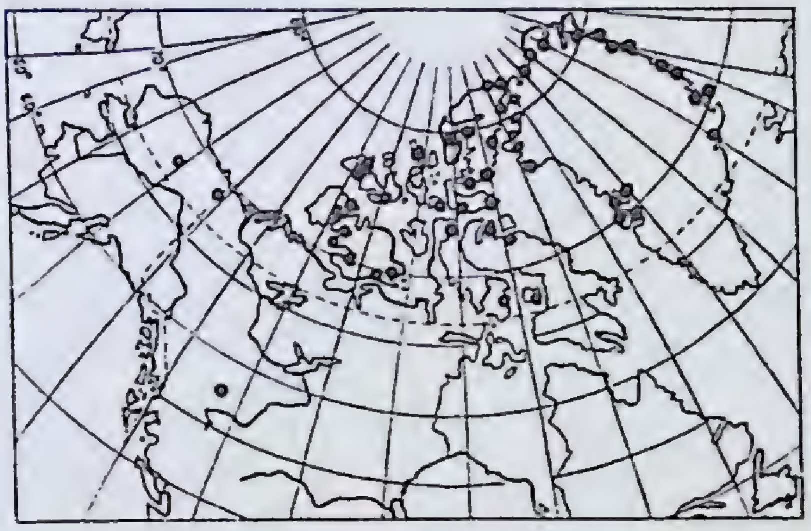
33. *Poa arctica* var. *vivipara*



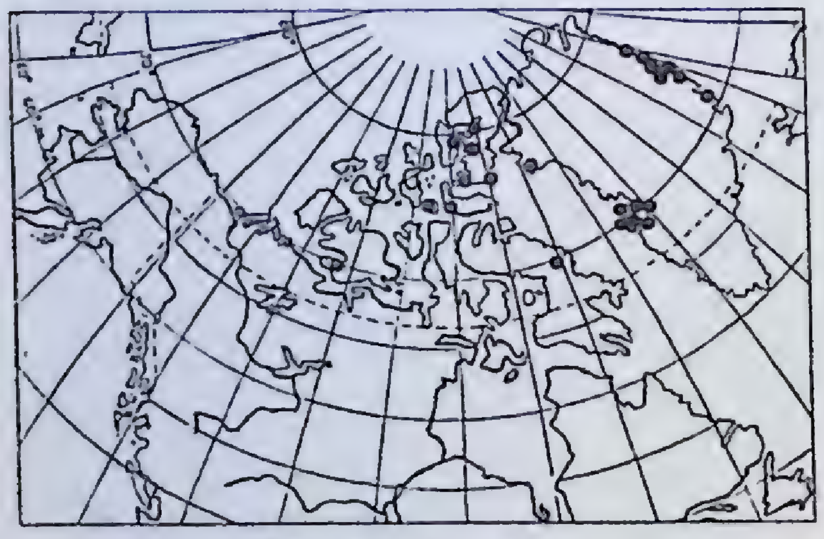
34. *Poa alpina*



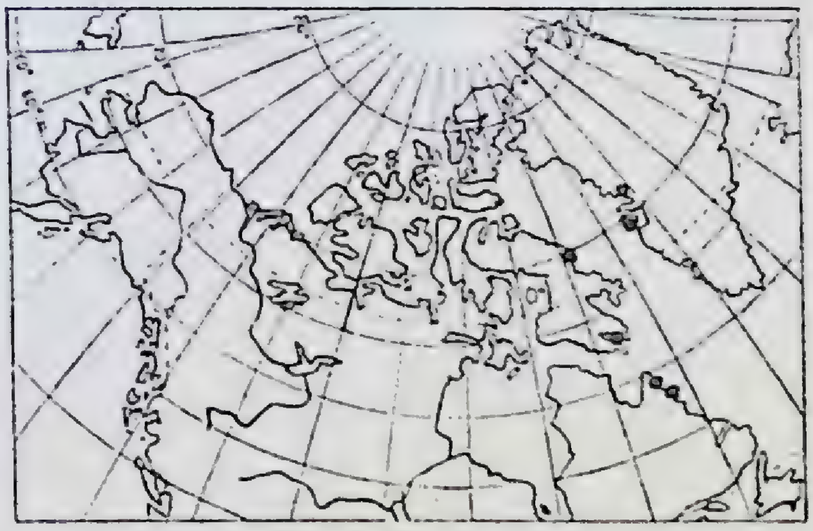
35. *Poa glauca*



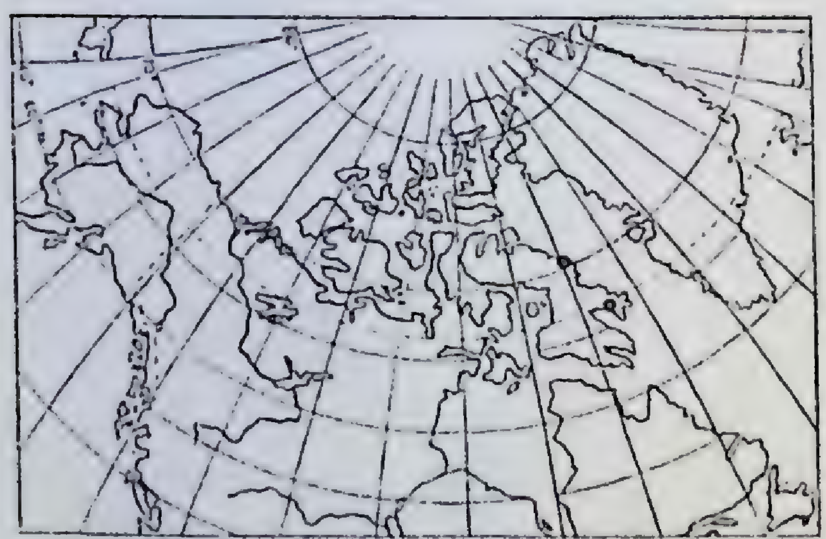
36. *Poa abbreviata*



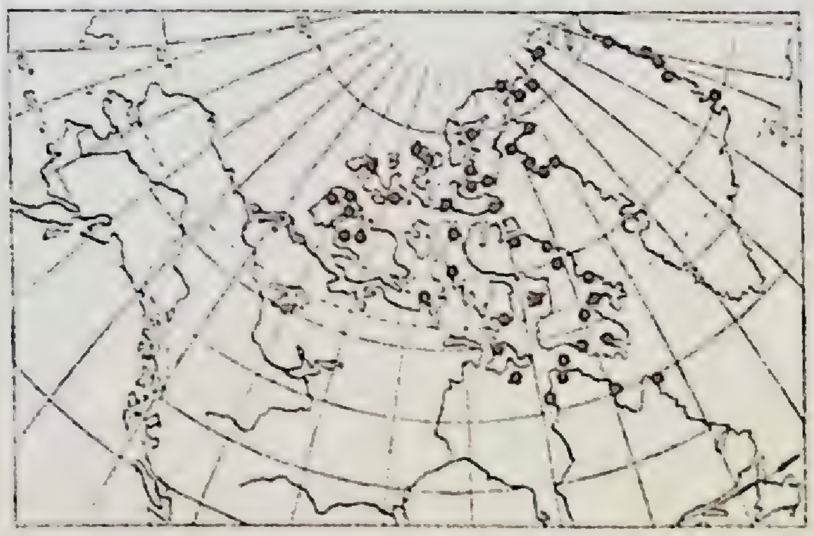
37. *Poa Hartzii*



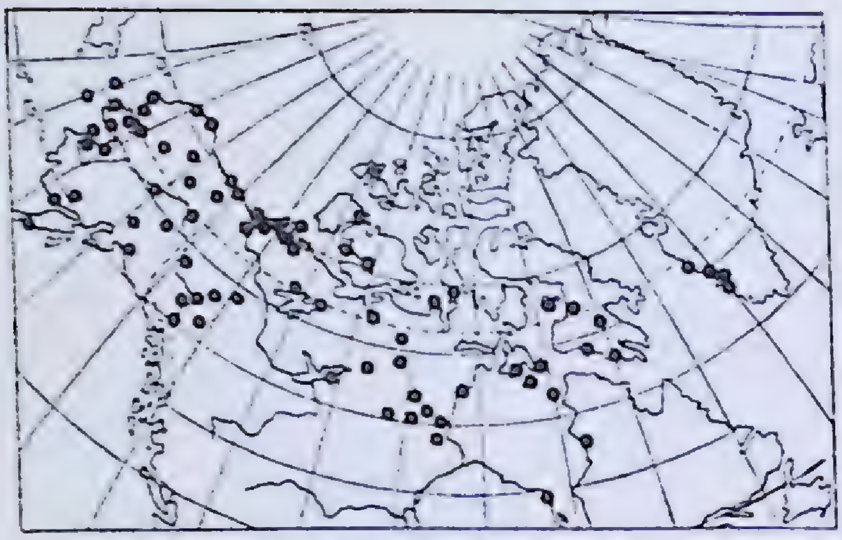
38. *Poa flexuosa*



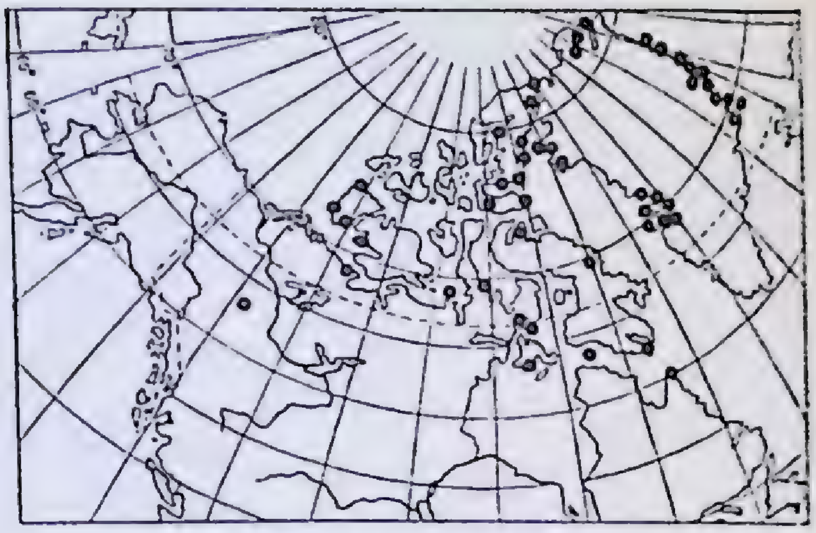
39. *Poa nascopieana*



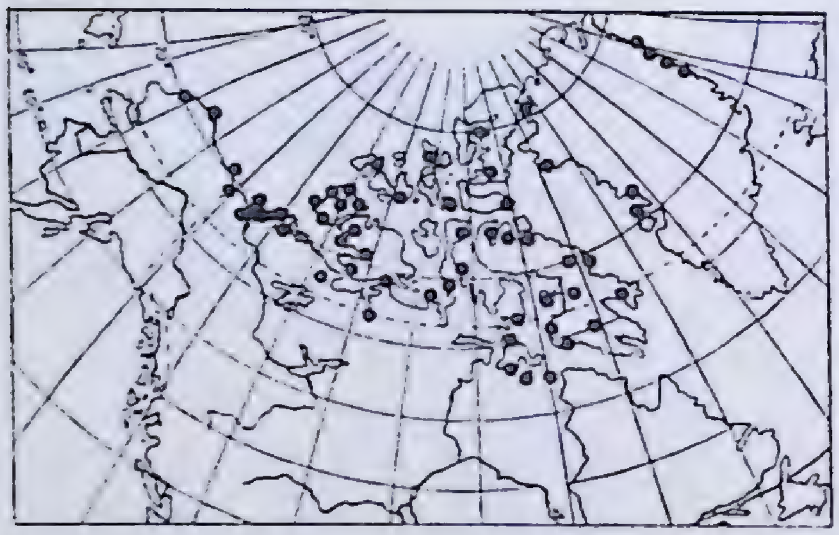
40. *Pleuropogon Sabinei*



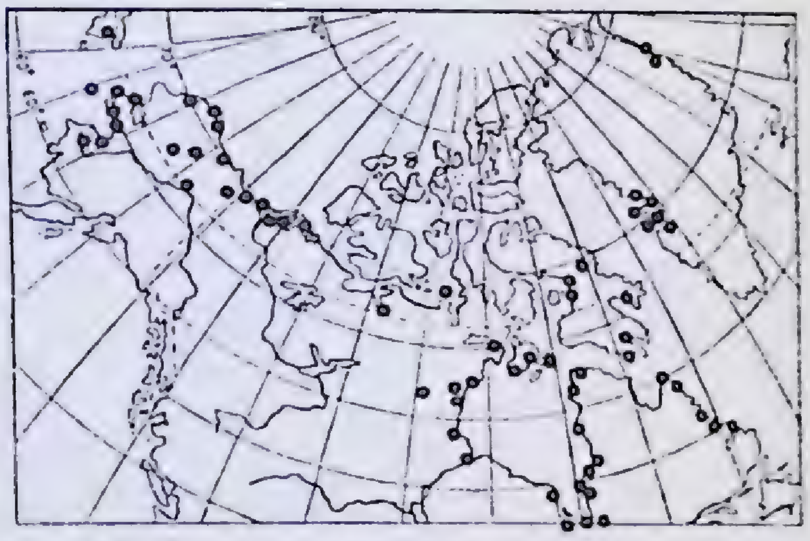
41. *Arctophila fulva*



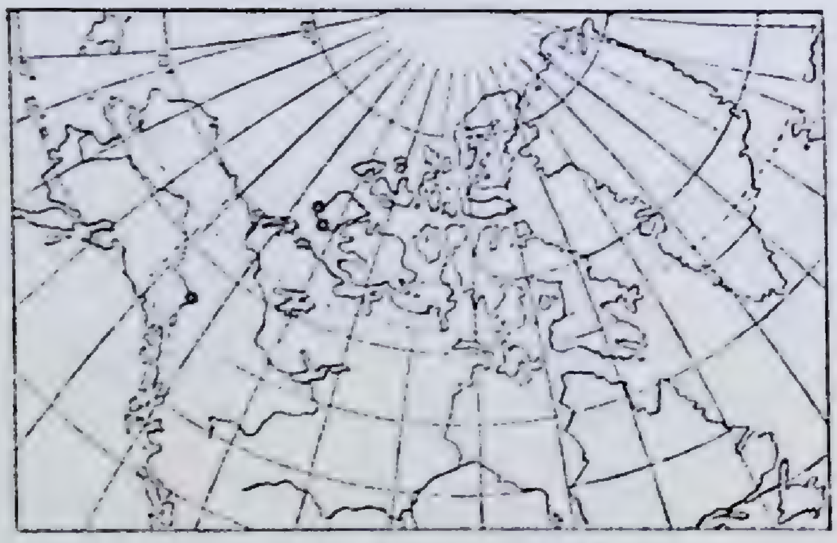
42. *Colpodium Vahlianum*



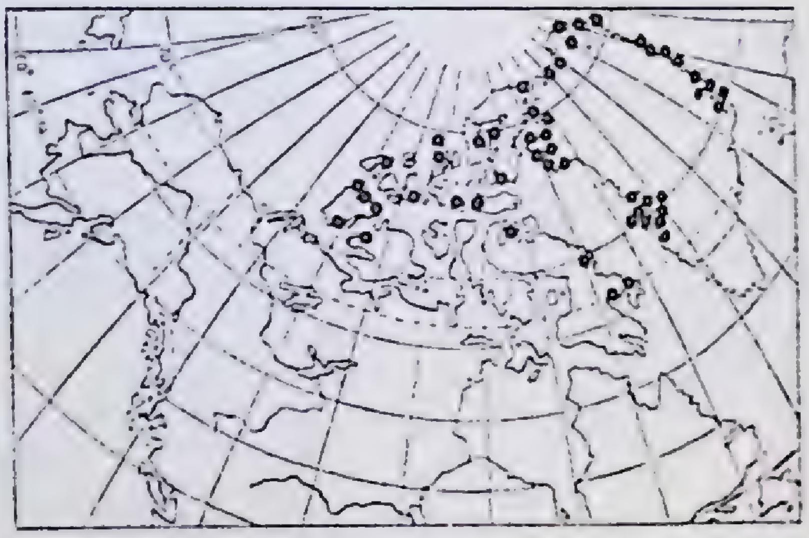
43. *Dupontia Fisheri*



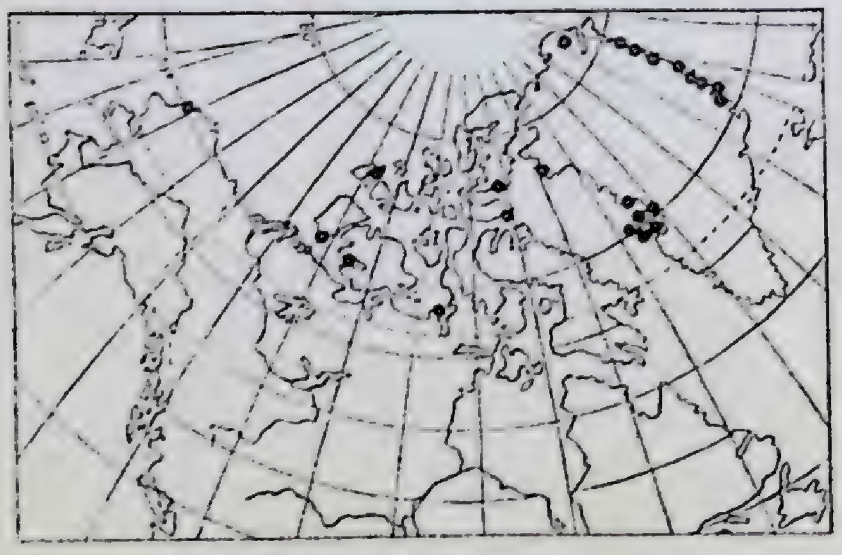
44. *Dupontia Fisheri* ssp. *psilosantha*



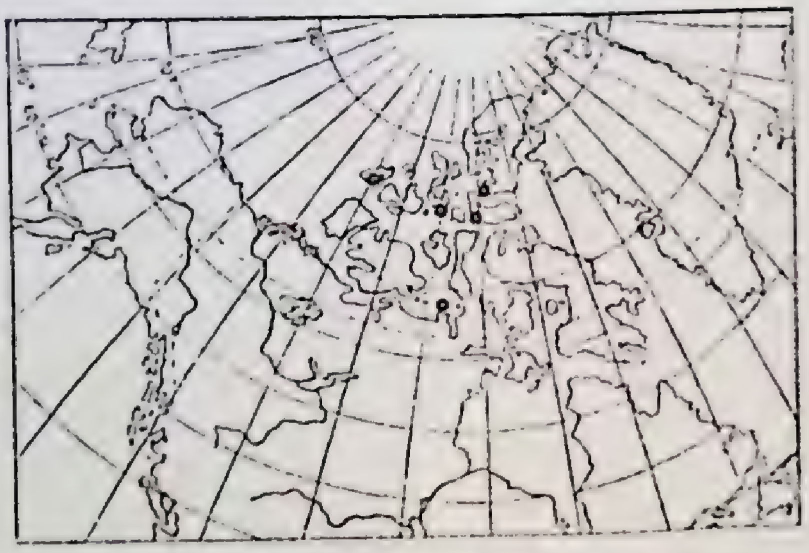
45. *Puccinellia agrostidea*



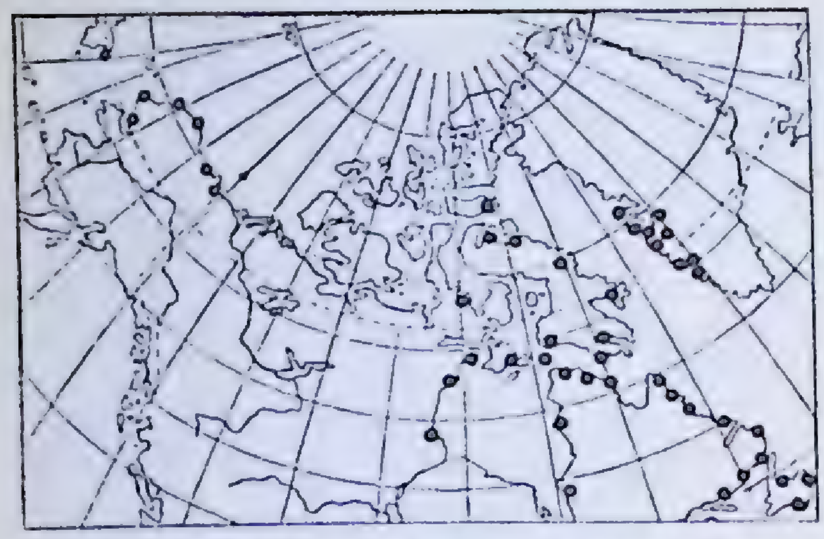
46. *Puccinellia angustata*



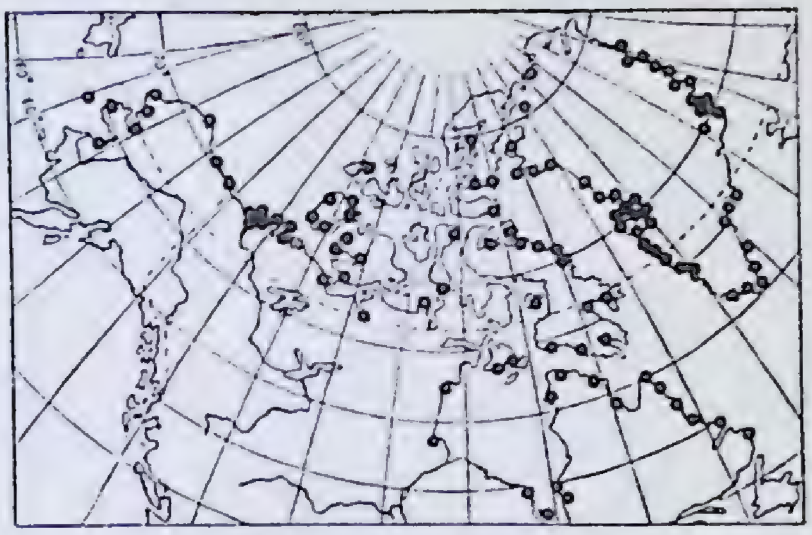
47. *Puccinellia Andersonii*



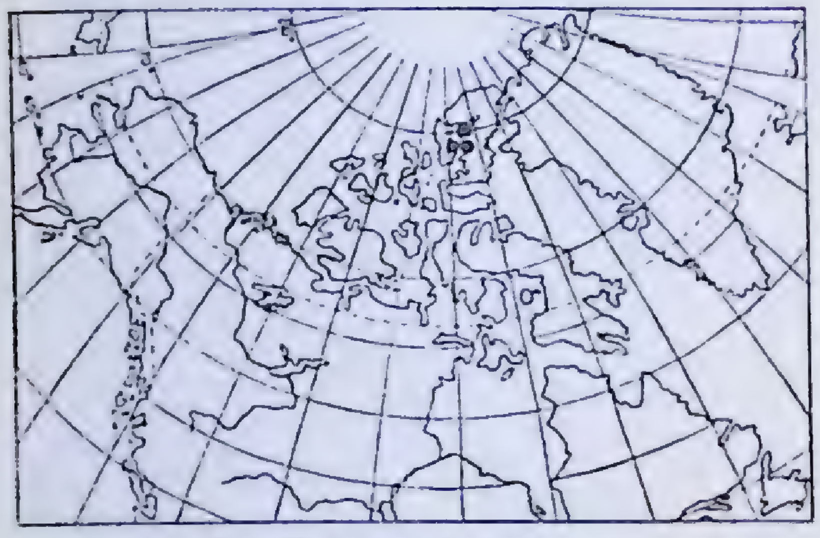
48. *Puccinellia Bruggemanni*



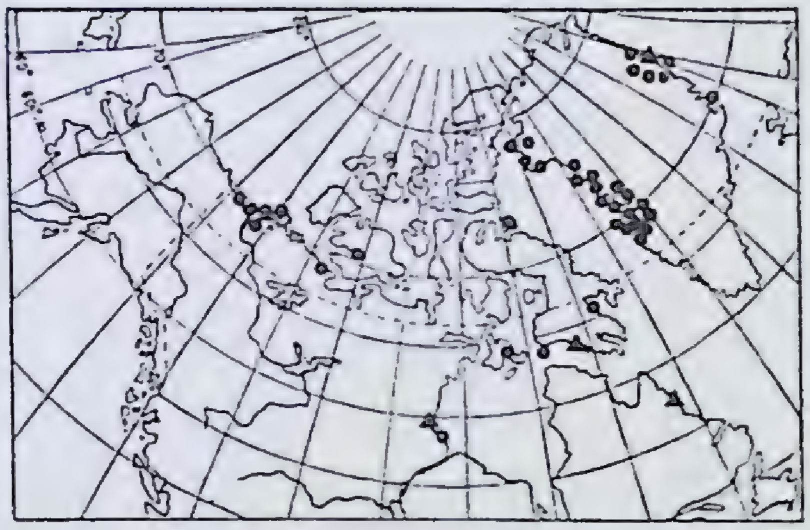
49. *Puccinellia Langeana* ssp. *typica*



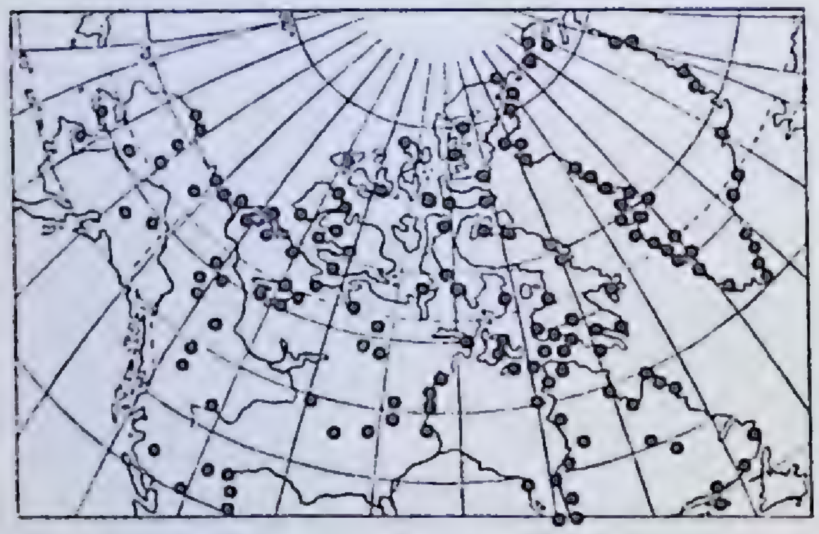
50. *Puccinellia phryganodes*



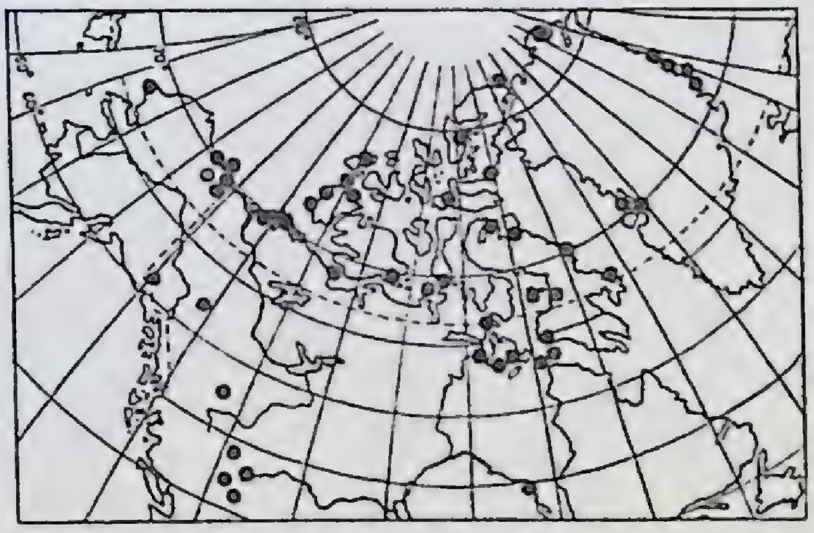
51. *Puccinellia poacea*



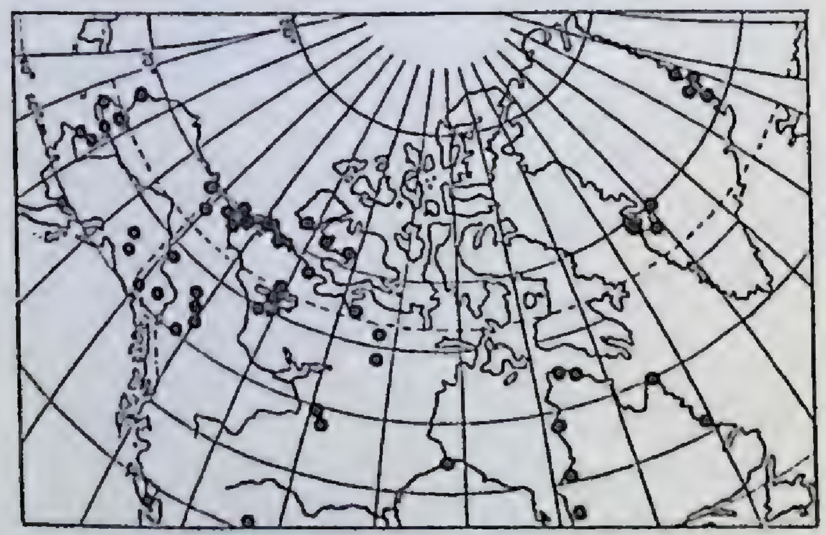
52. *Puccinellia vaginata* (solid circles)
var. *paradoxa* (triangles)



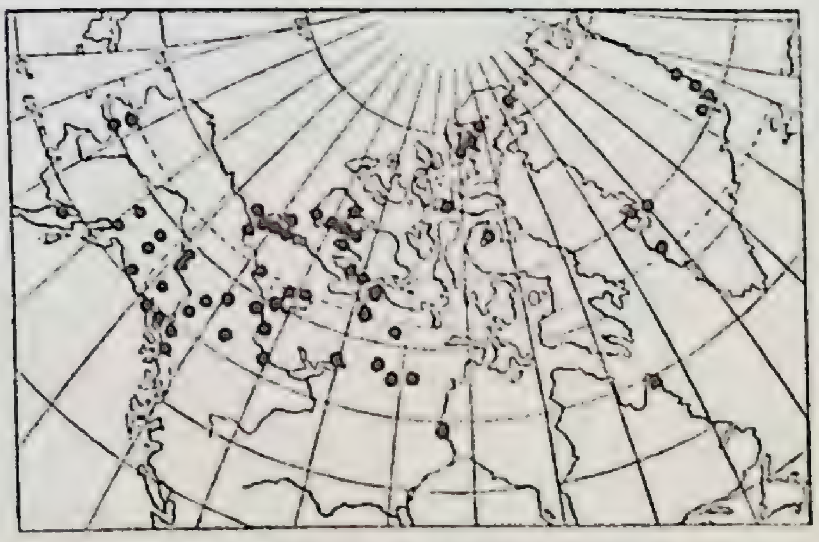
53. *Festuca brachyphylla*



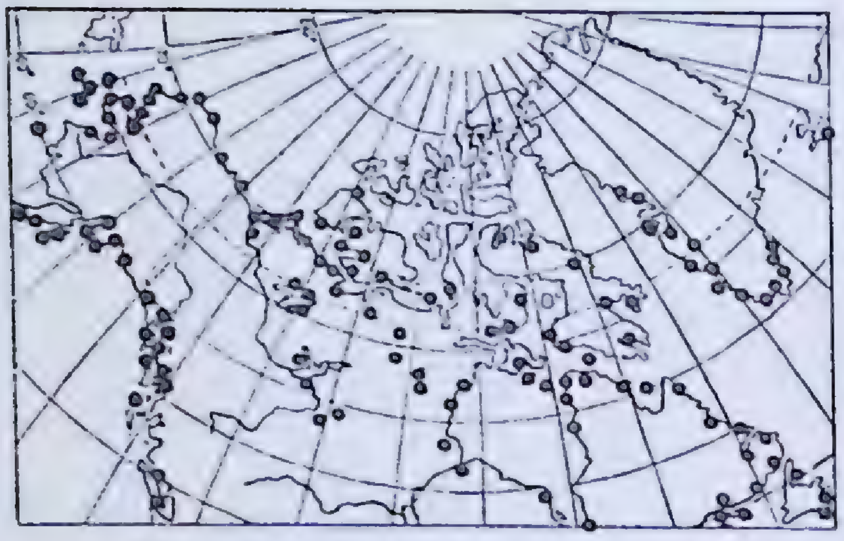
54. *Festuca baffinensis*



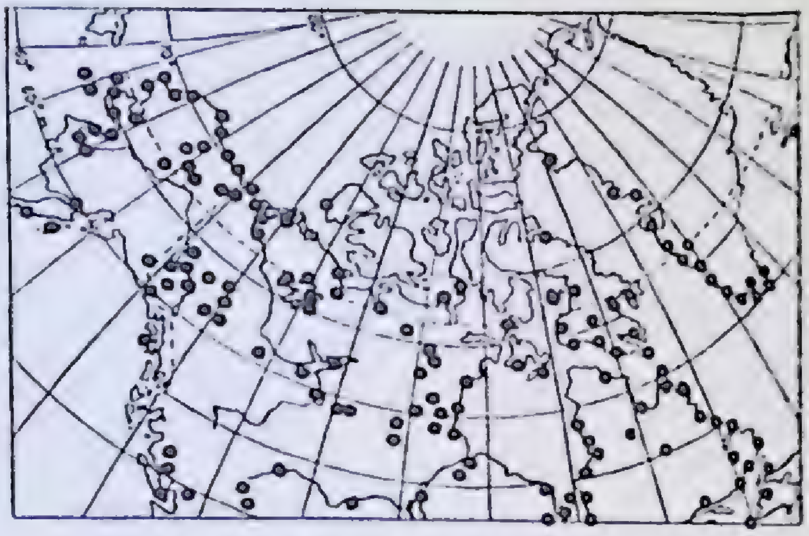
55. *Festuca rubra* var. *arenaria*



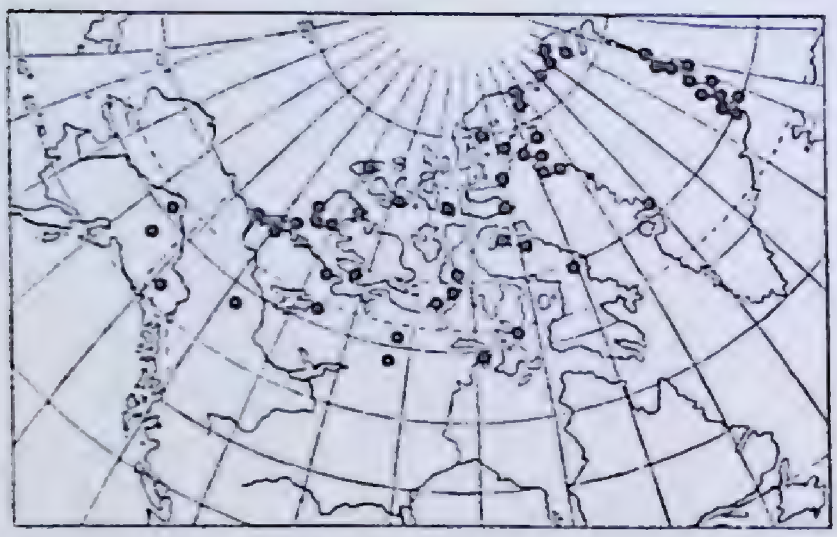
56. *Agropyron latiglume*



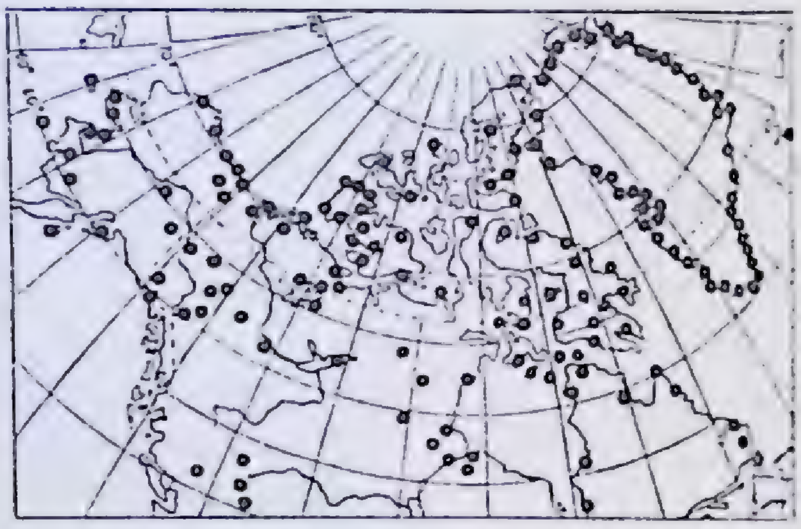
57. *Elymus arenarius* ssp. *mollis*



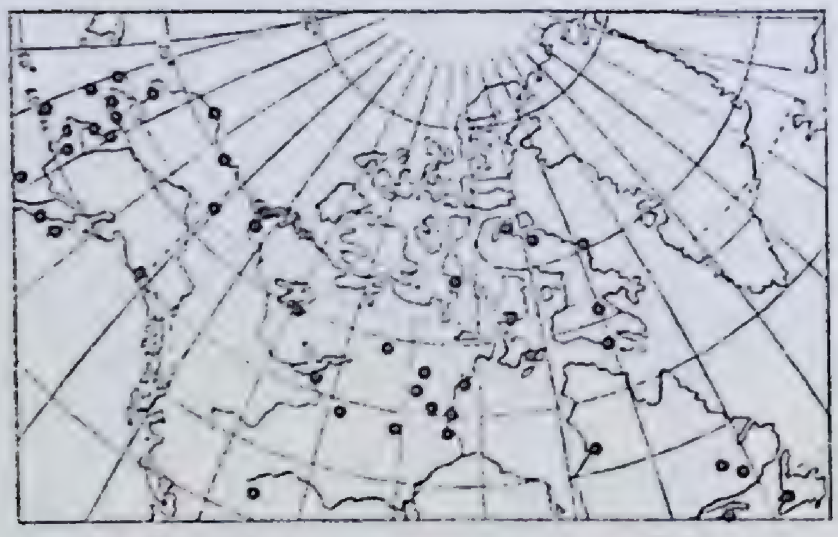
58. *Eriophorum angustifolium*



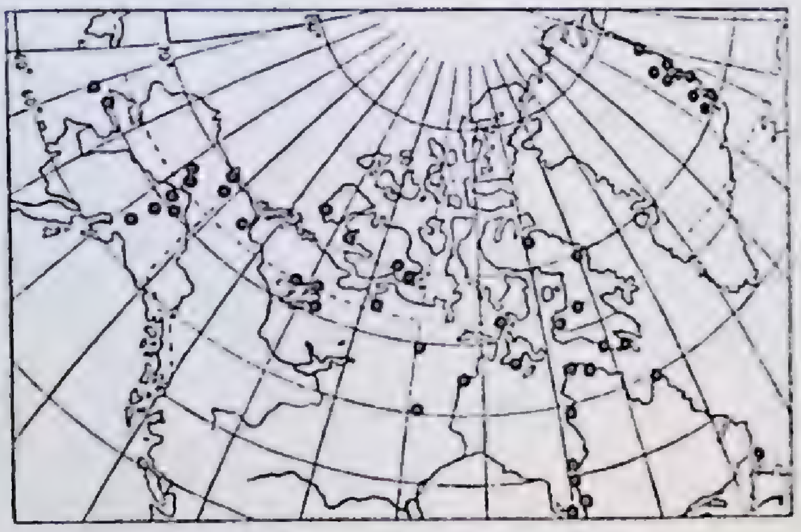
59. *Eriophorum triste*



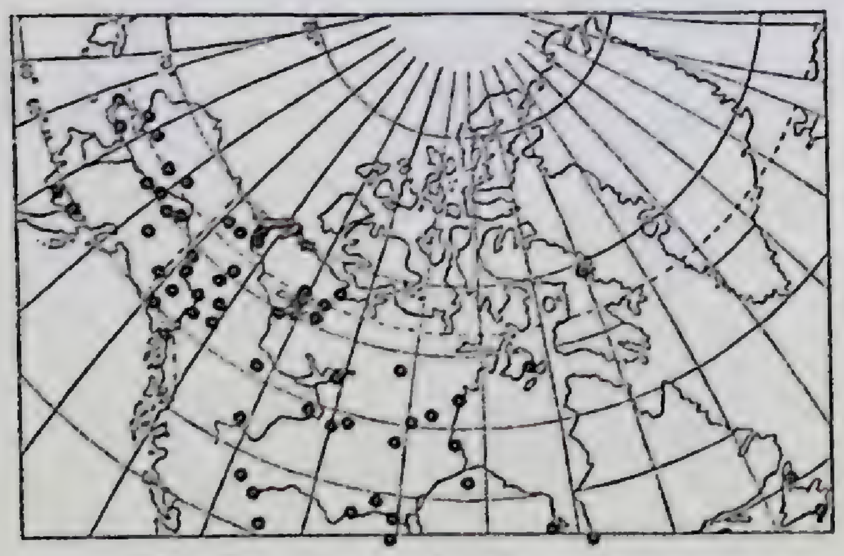
60. *Eriophorum Scheuchzeri*



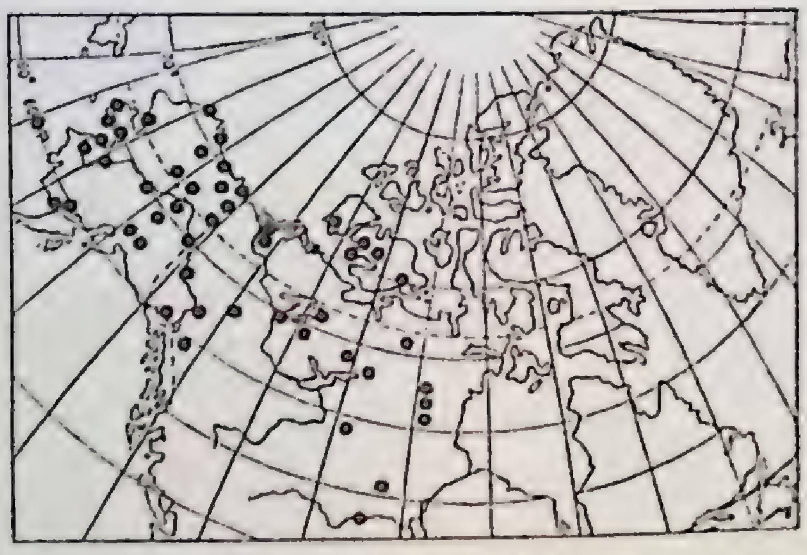
61. *Eriophorum russeolum* var. *albidum*



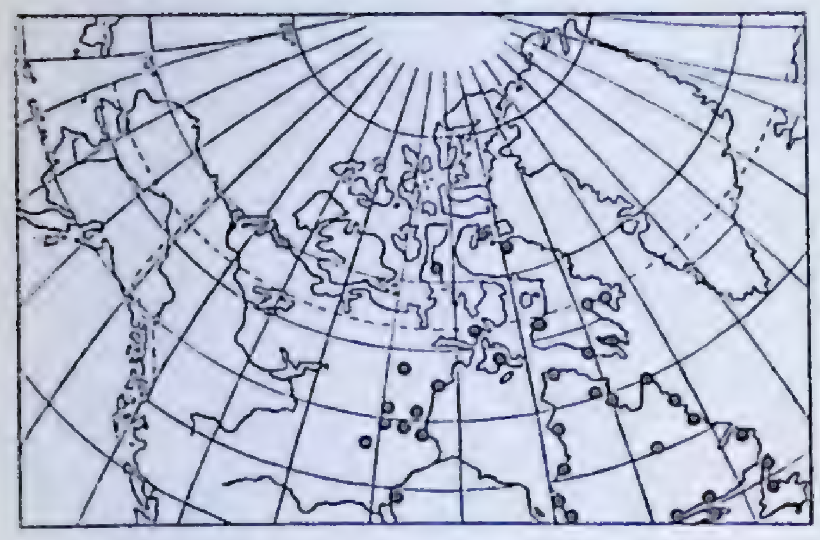
62. *Eriophorum callitrix*



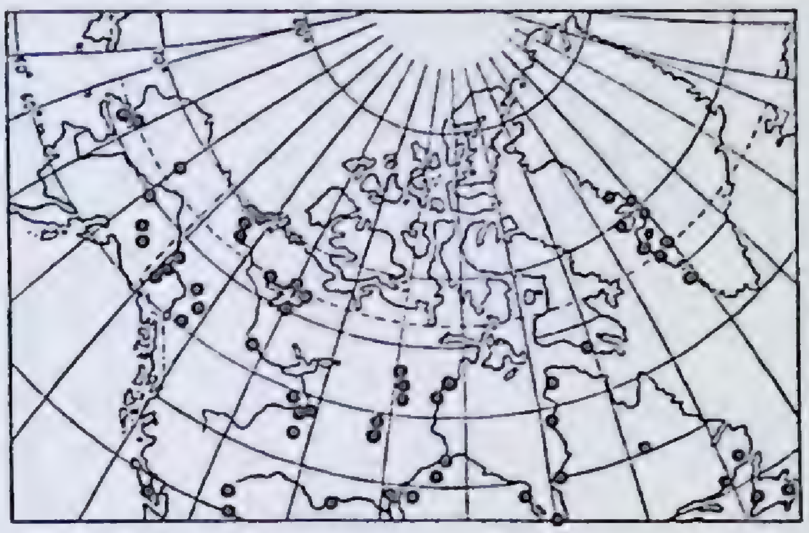
63. *Eriophorum brachyantherum*



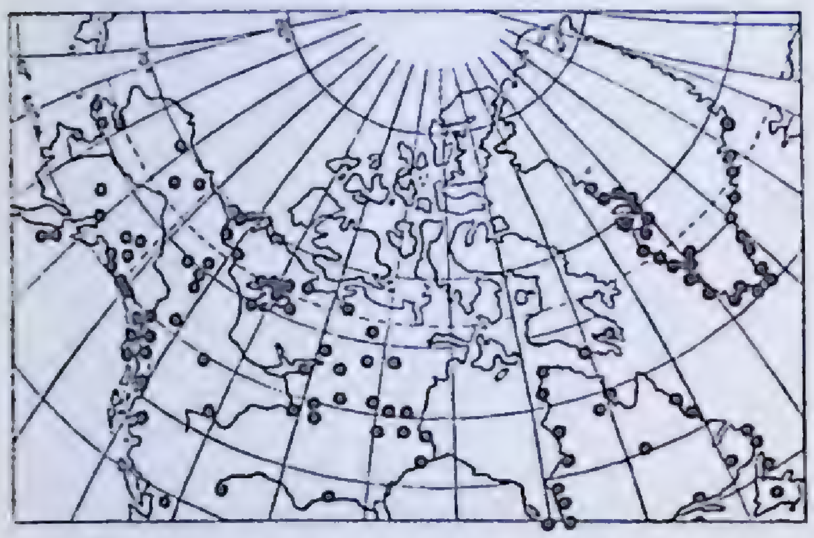
64. *Eriophorum vaginatum*



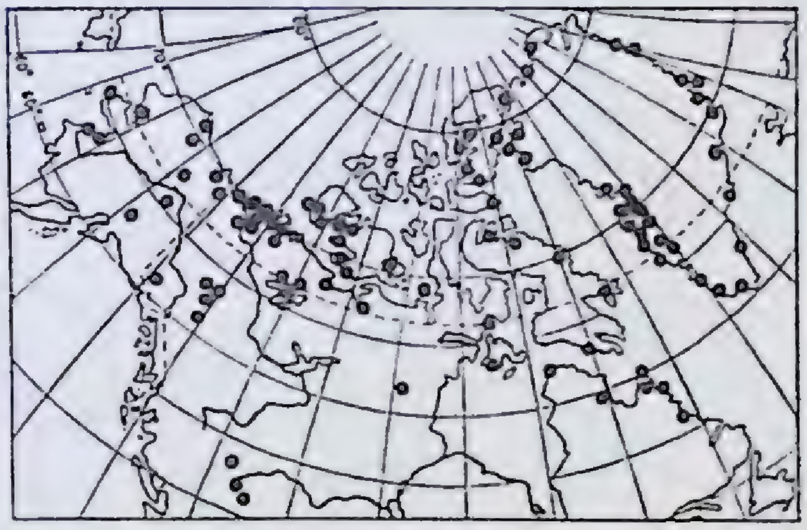
65. *Eriophorum vaginatum* ssp. *spissum*



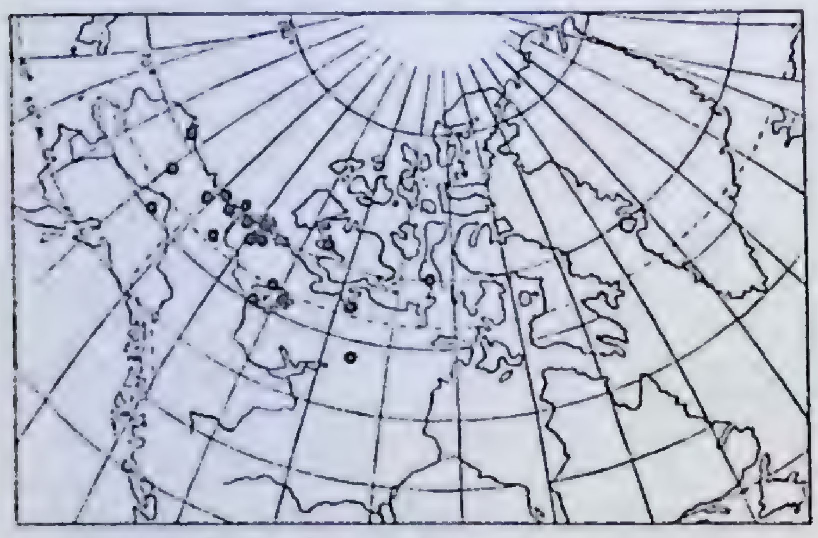
66. *Eleocharis acicularis*



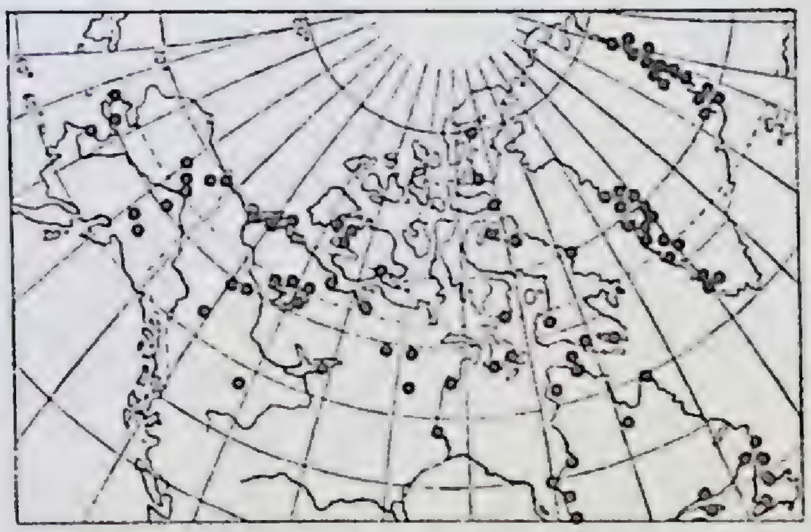
67. *Scirpus caespitosus* ssp. *austriacus*



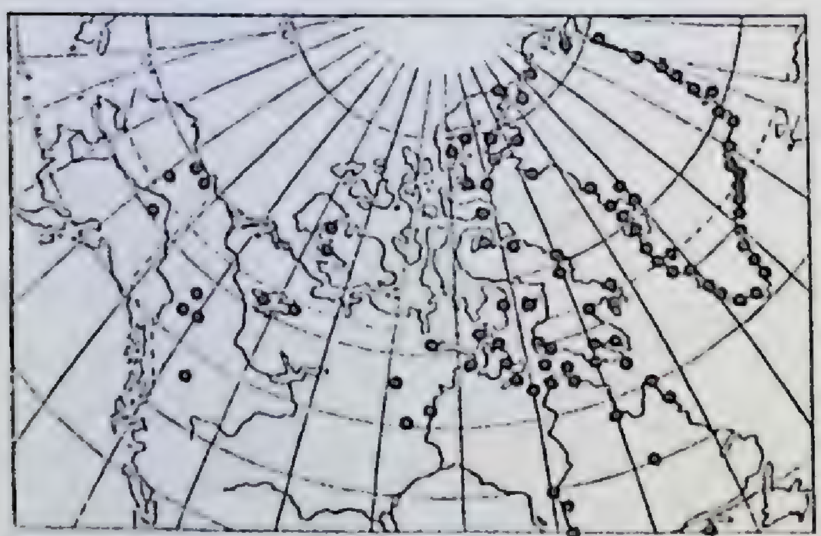
68. *Kobresia myosuroides*



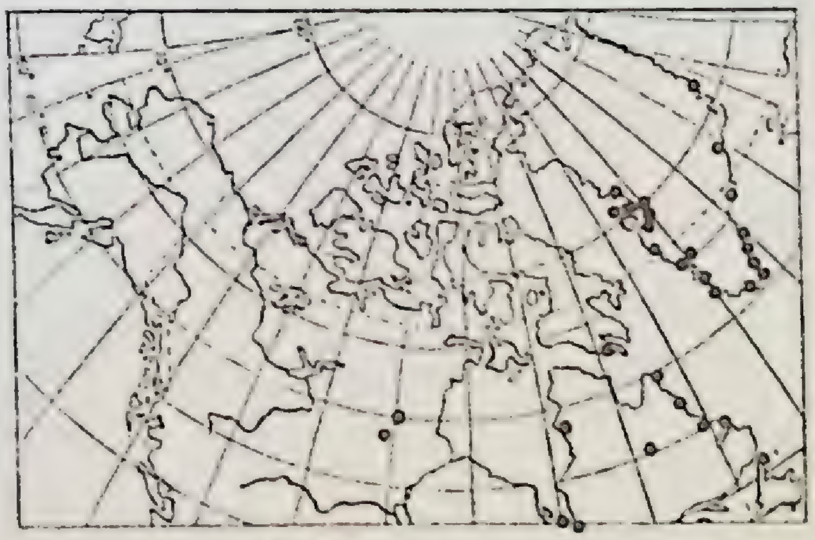
69. *Kobresia hyperborea*



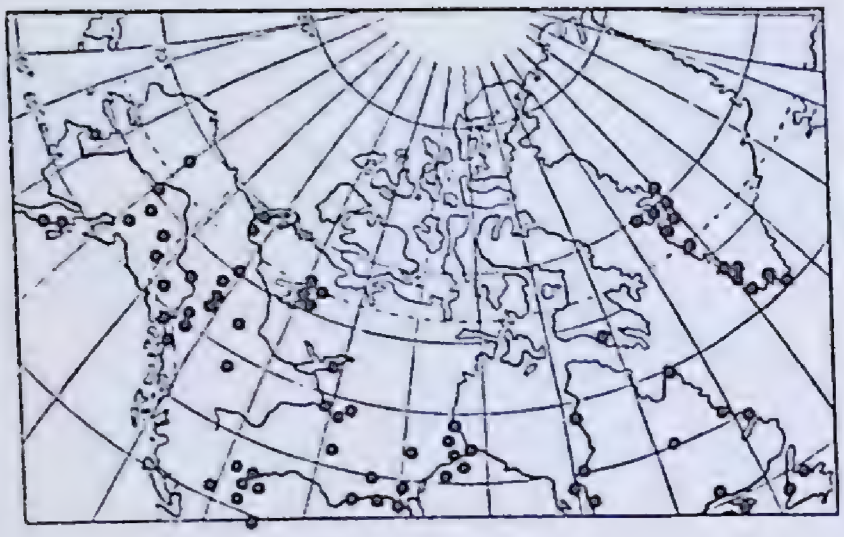
70. *Kobresia simpliciuscula*



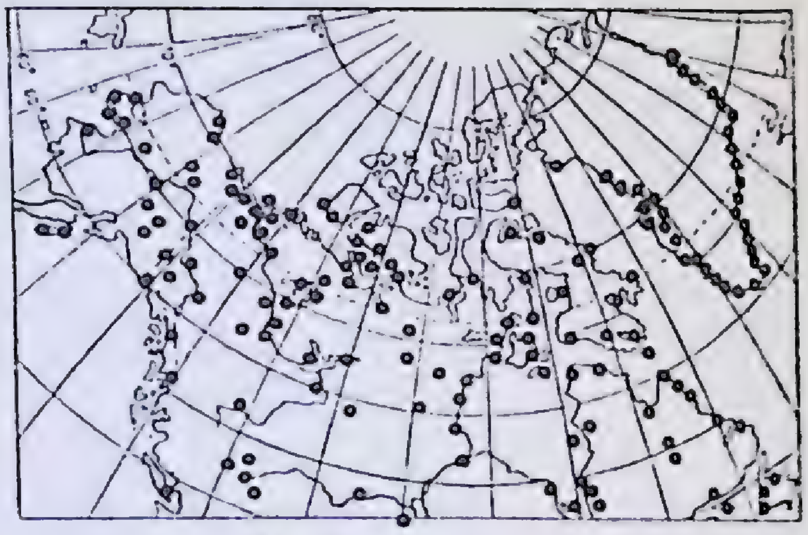
71. *Carex nardina* var. *atriceps*



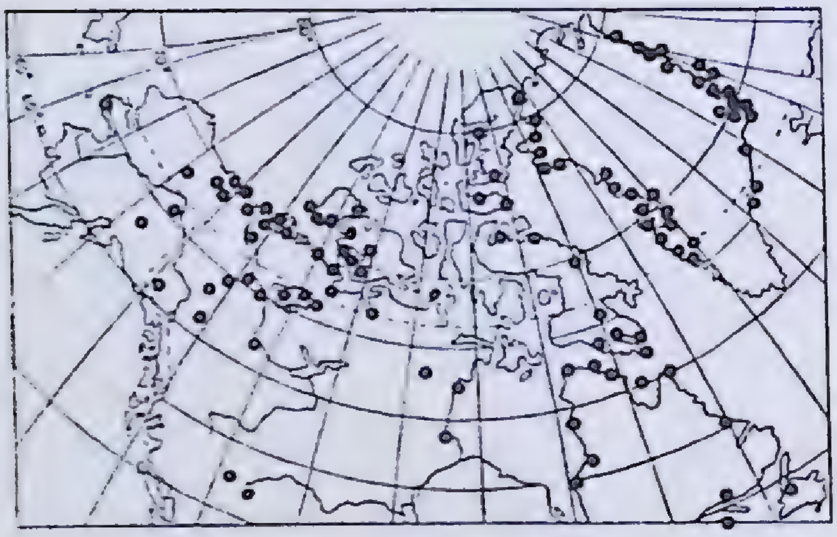
72. *Carex arctogena*



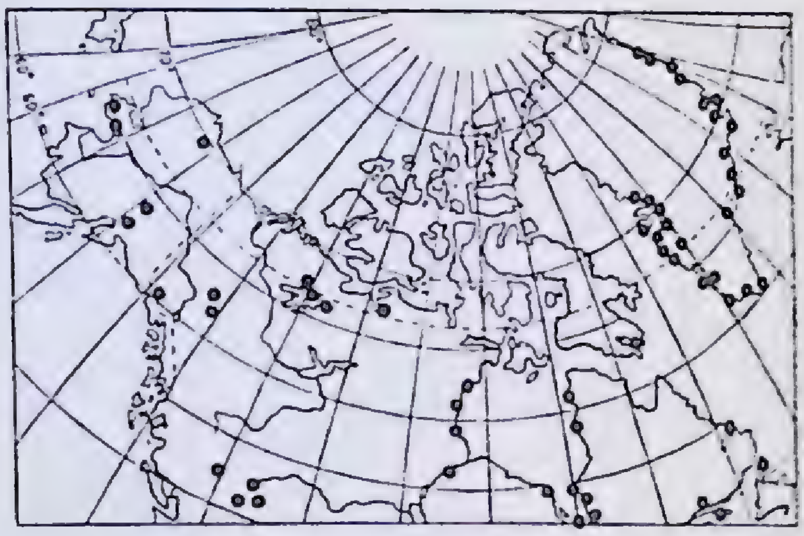
73. *Carex gynocrates*



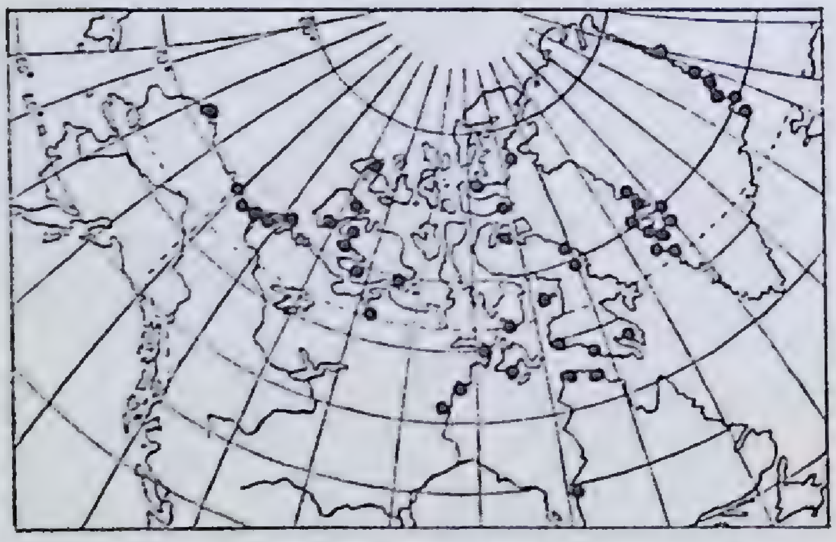
74. *Carex scirpoidea*



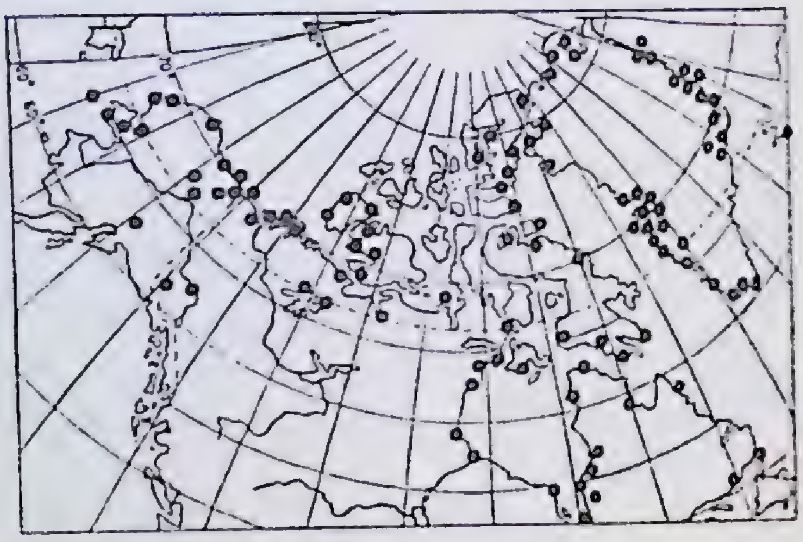
75. *Carex rupestris*



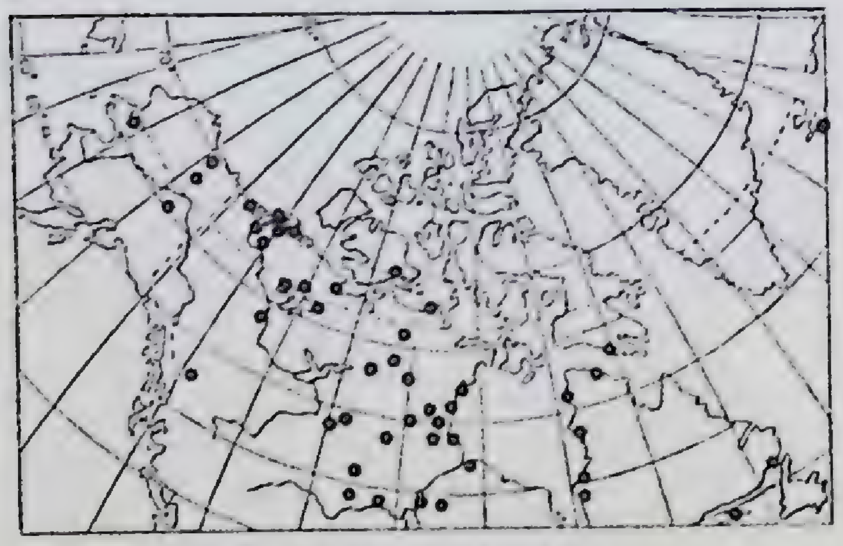
76. *Carex microglochin*



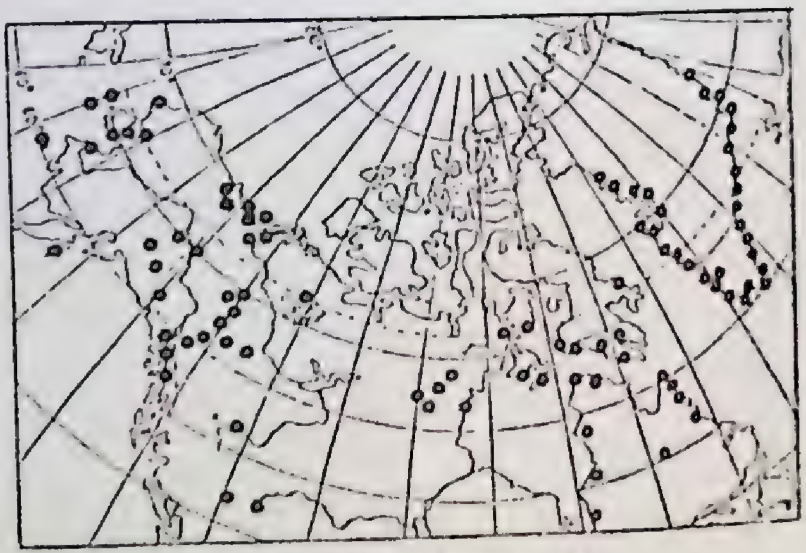
77. *Carex ursina*



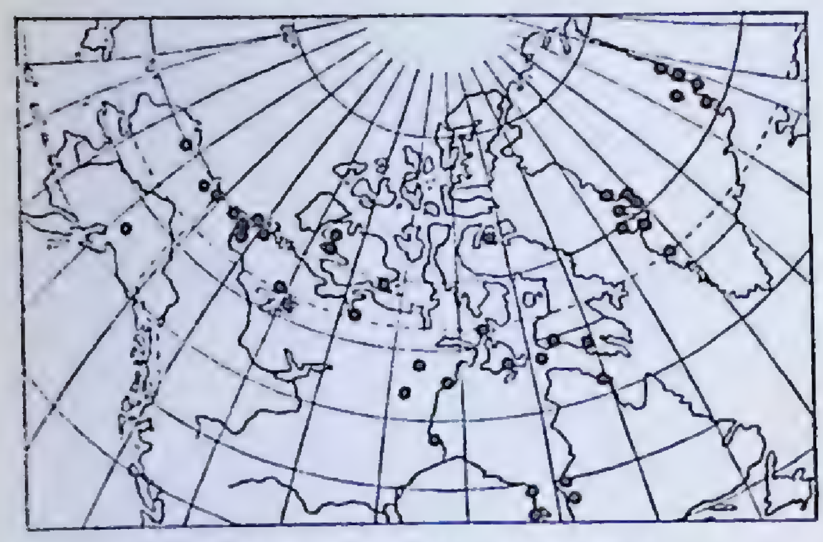
78. *Carex maritima*



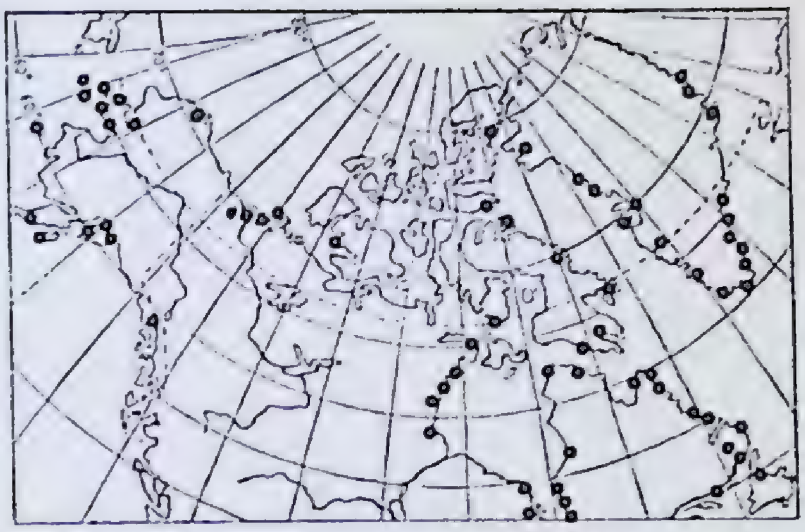
79. *Carex chordorrhiza*



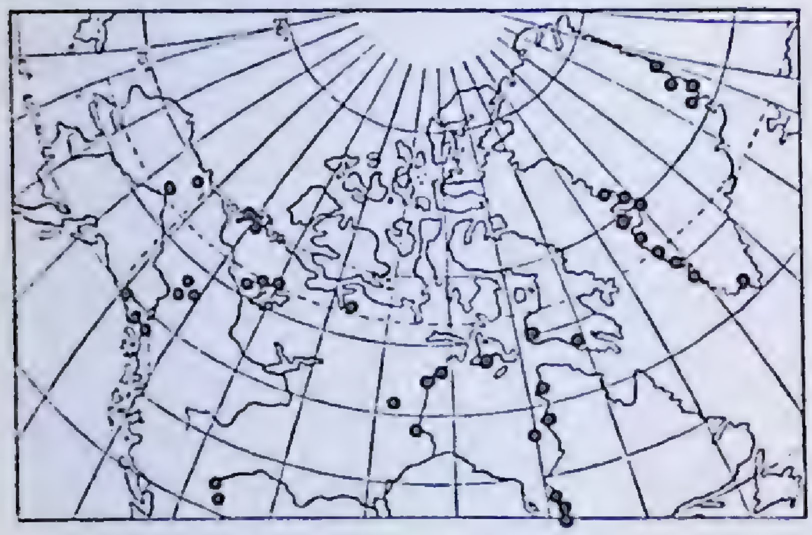
80. *Carex Lachenalii*



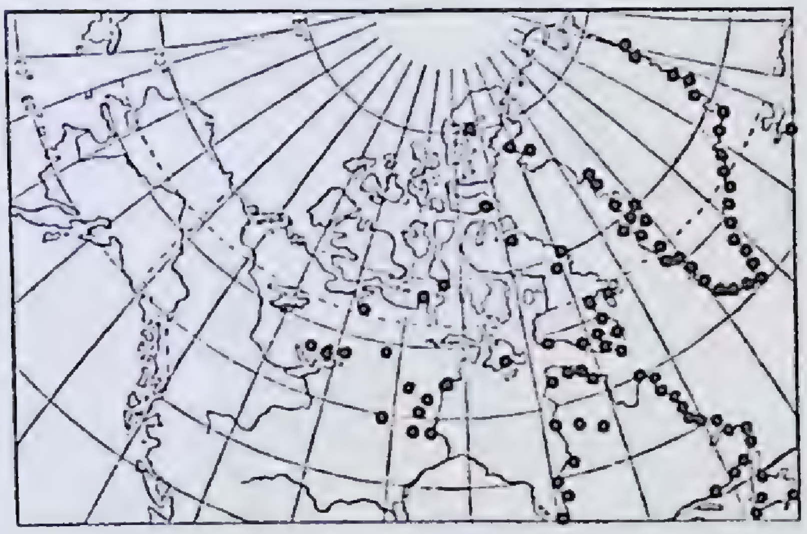
81. *Carex amblyorhyncha* s. lat.



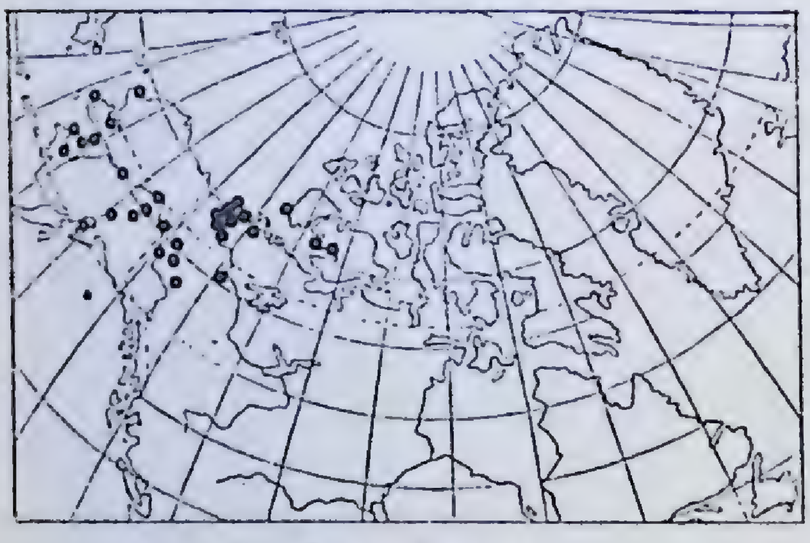
82. *Carex glareosa* var. *amphigena*



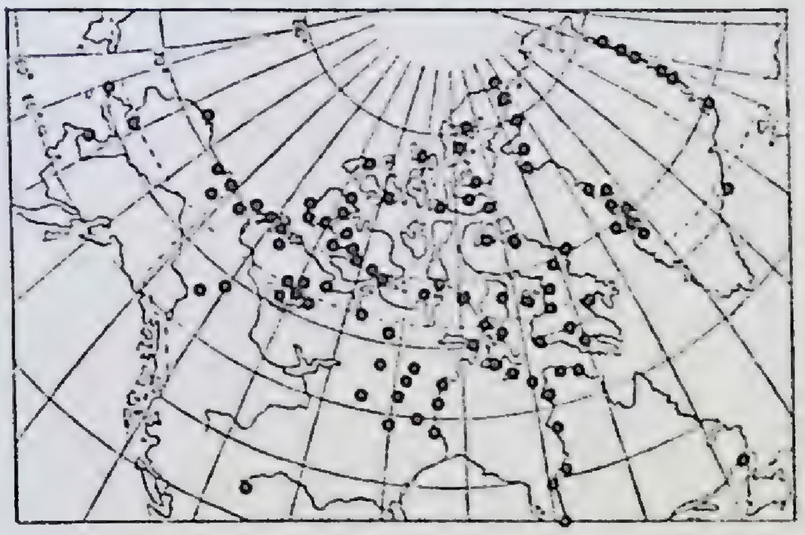
83. *Carex bicolor*



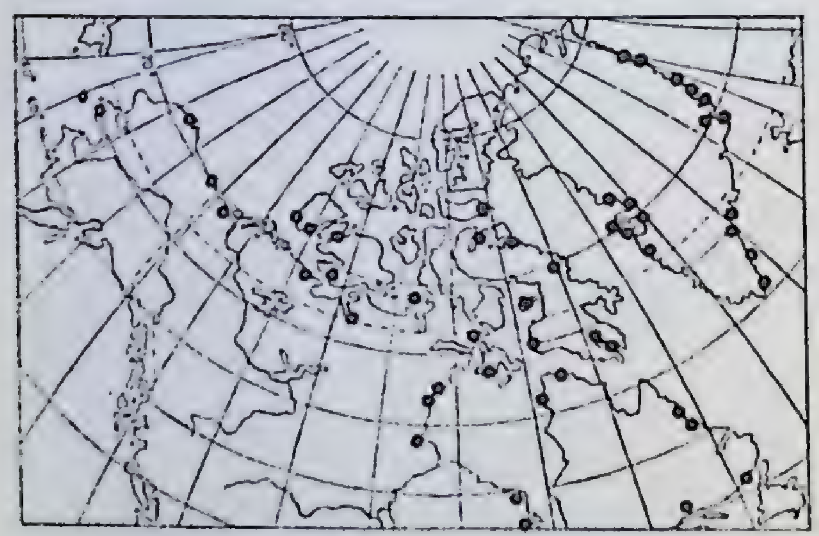
84. *Carex Bigelowii*



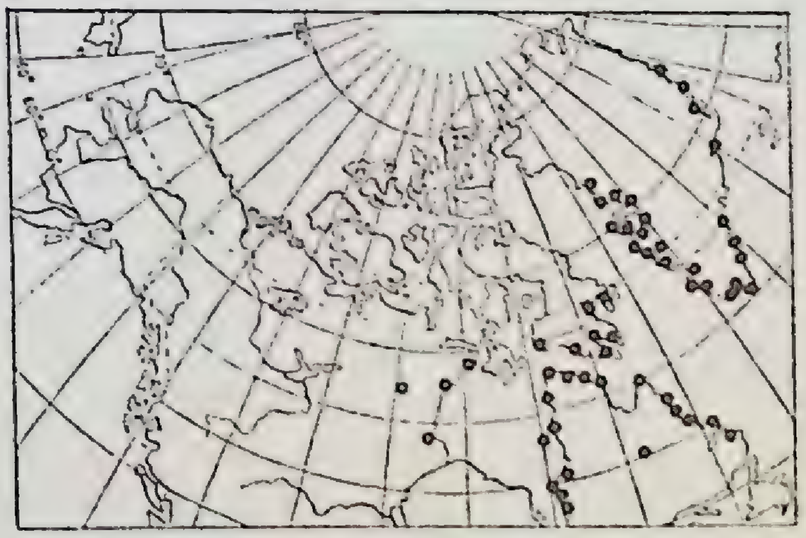
85. *Carex lugens*



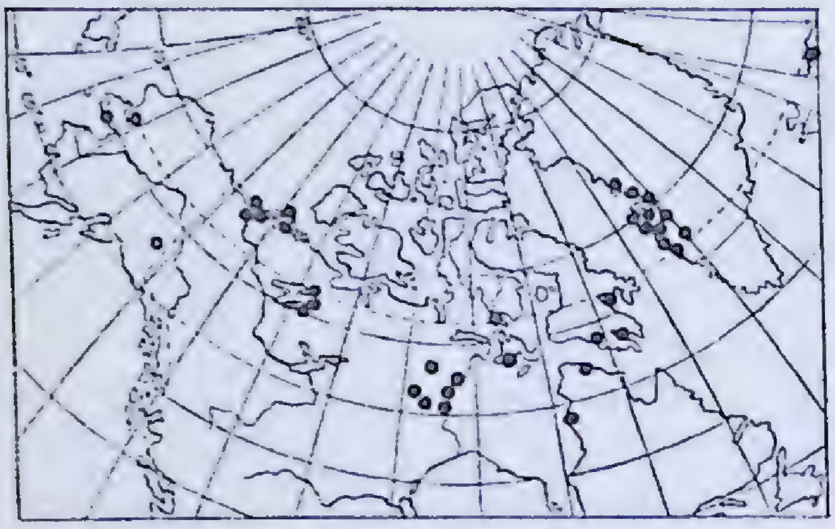
86. *Carex stans*



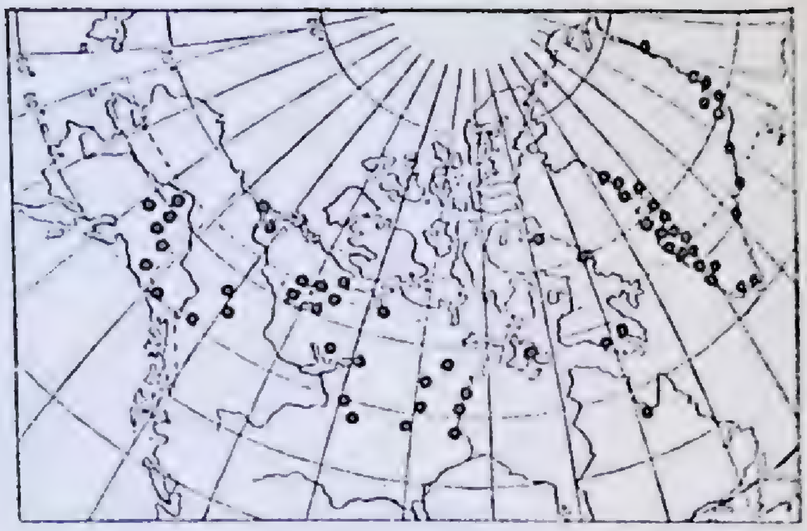
87. *Carex subspathacea*



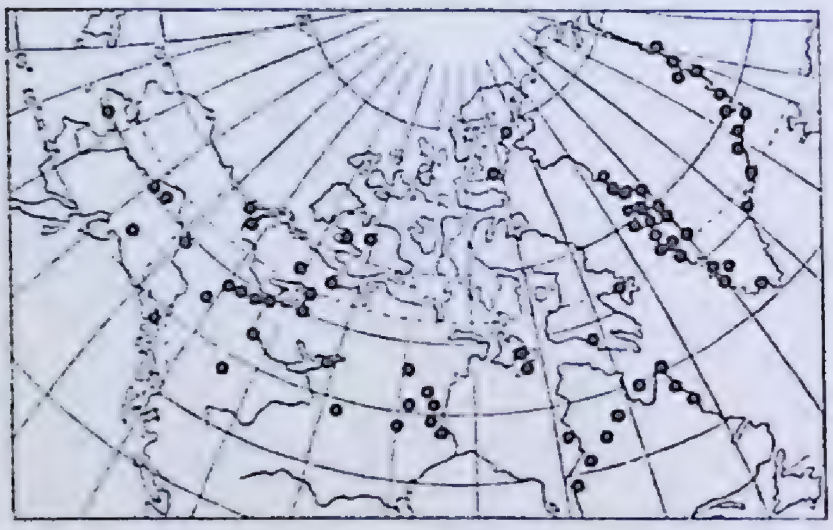
88. *Carex norvegica*



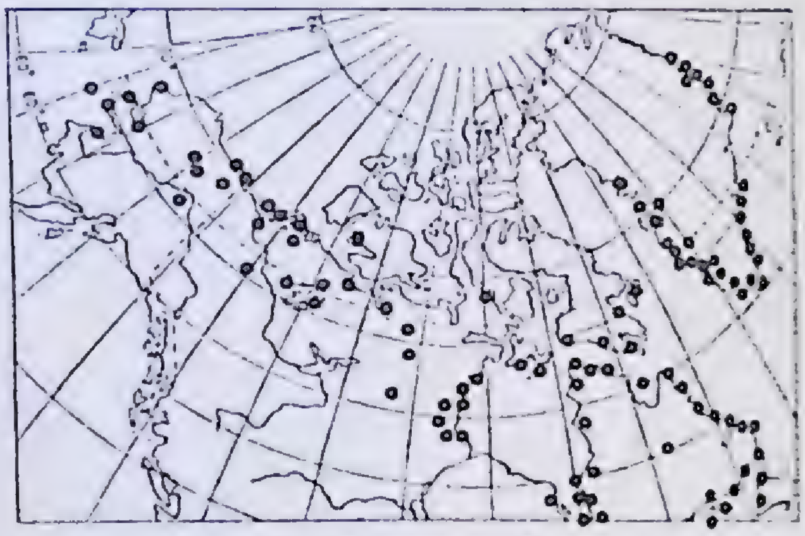
89. *Carex holostoma*



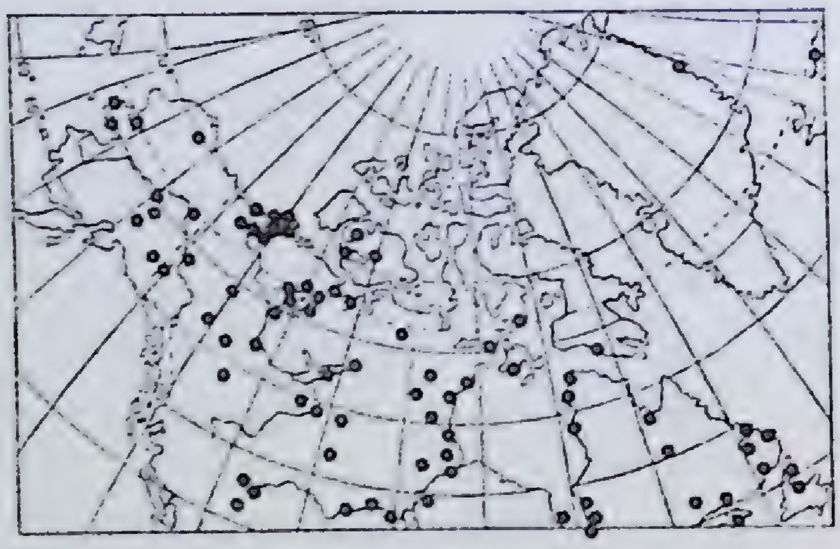
90. *Carex supina* ssp. *spaniocarpa*



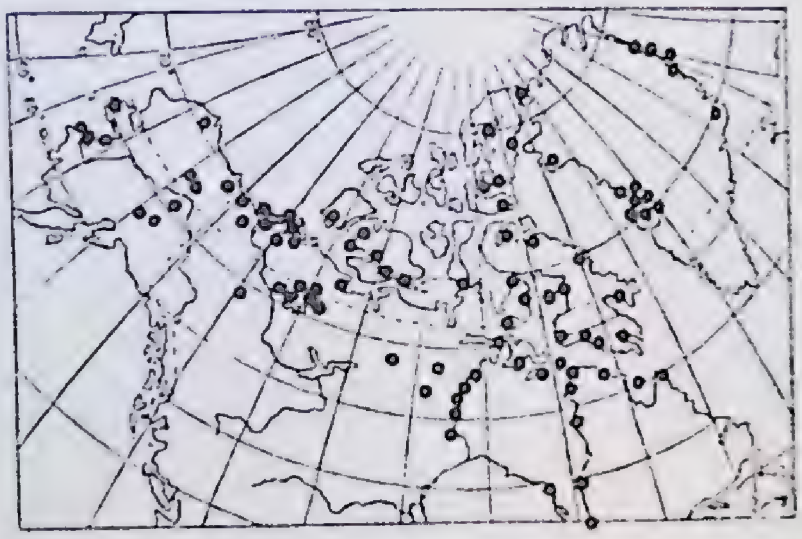
91. *Carex glacialis*



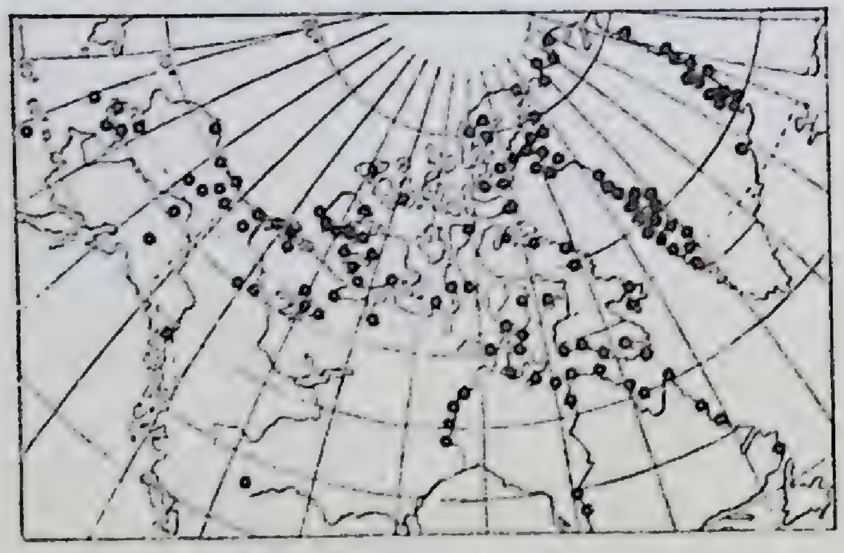
92. *Carex rariflora*



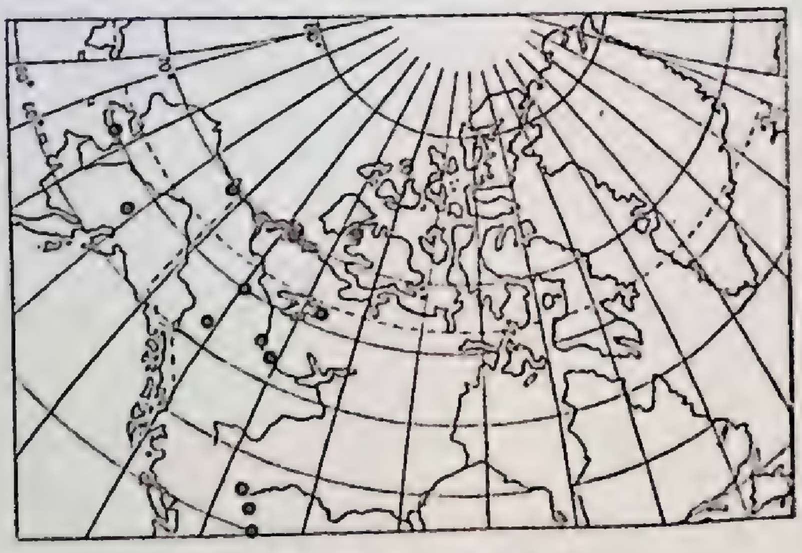
93. *Carex vaginata*



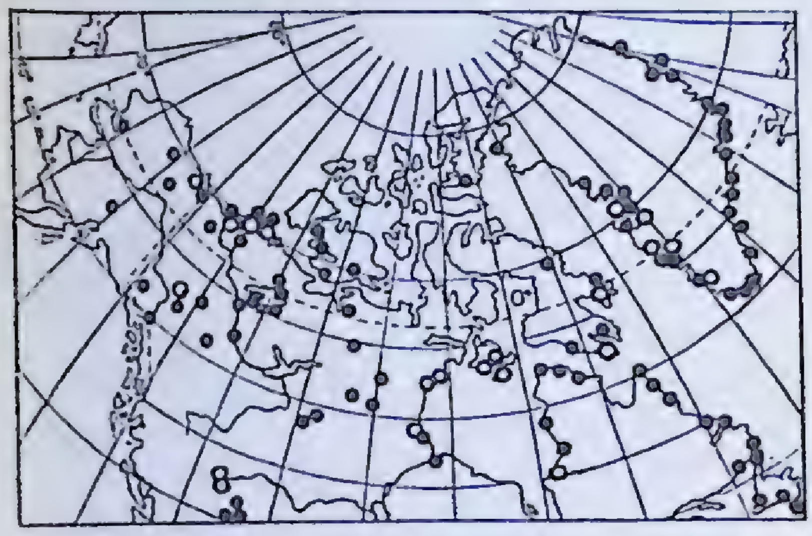
94. *Carex atrofusca*



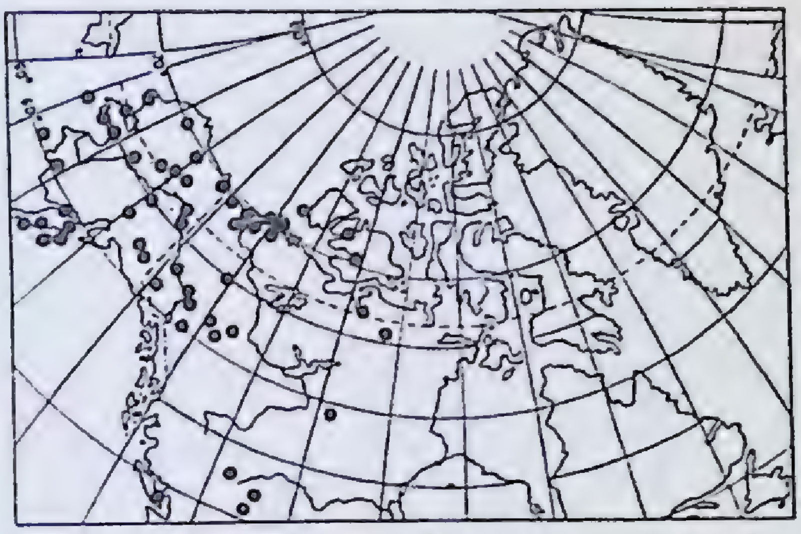
95. *Carex misandra*



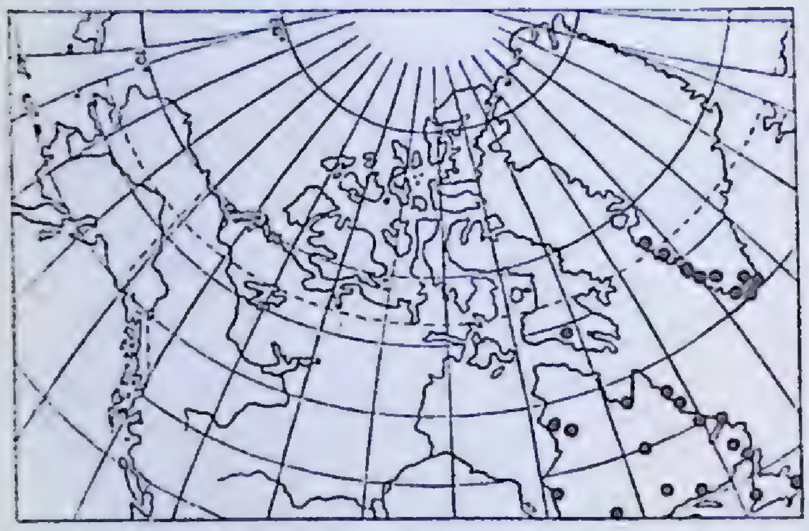
96. *Carex petricosa*



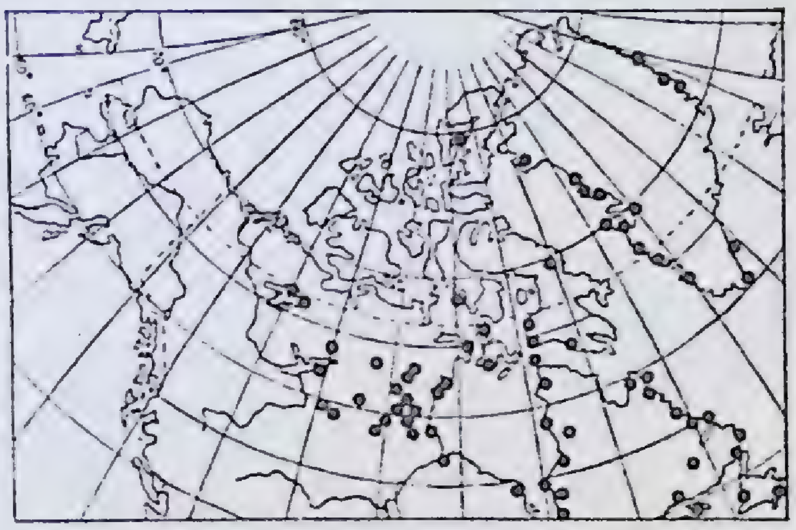
97. *Carex capillaris* (solid circles) var. *major* (open circles)



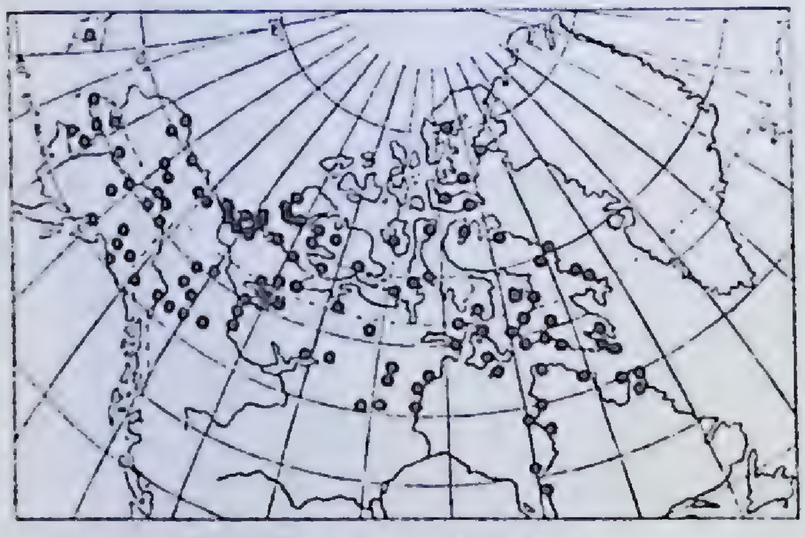
98. *Carex physocarpa*



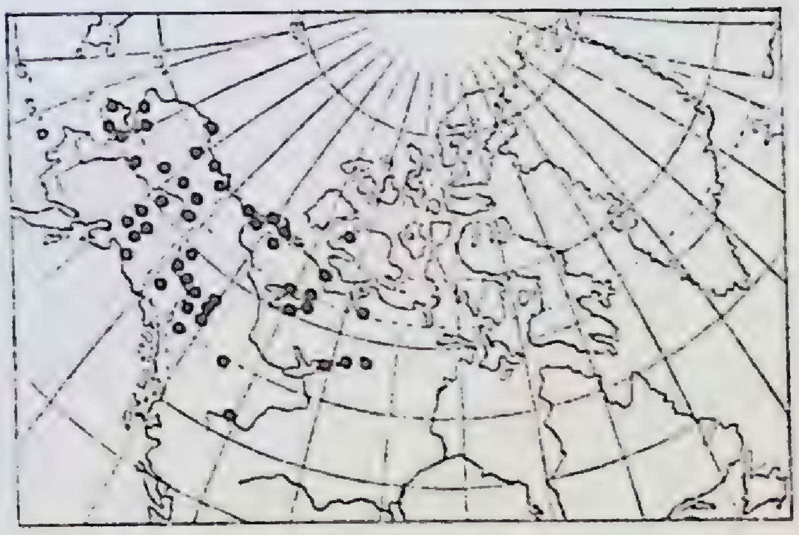
99. *Carex saxatilis* var. *miliaris*



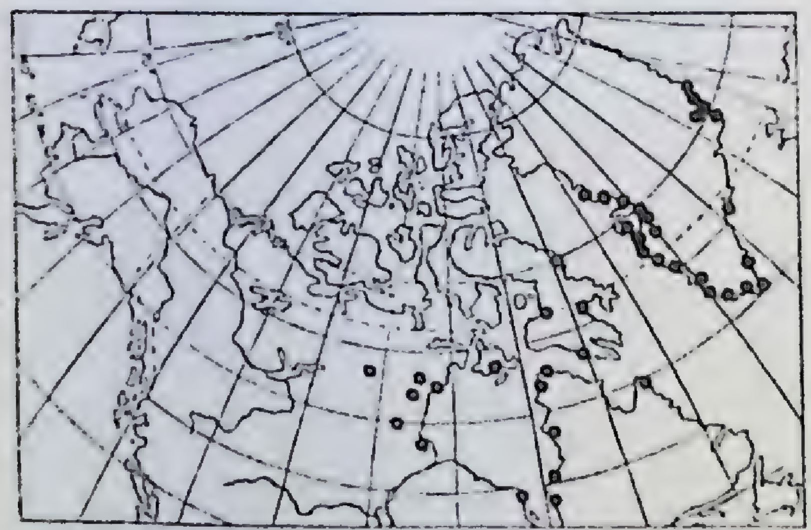
100. *Carex saxatilis* var. *rhomalea*



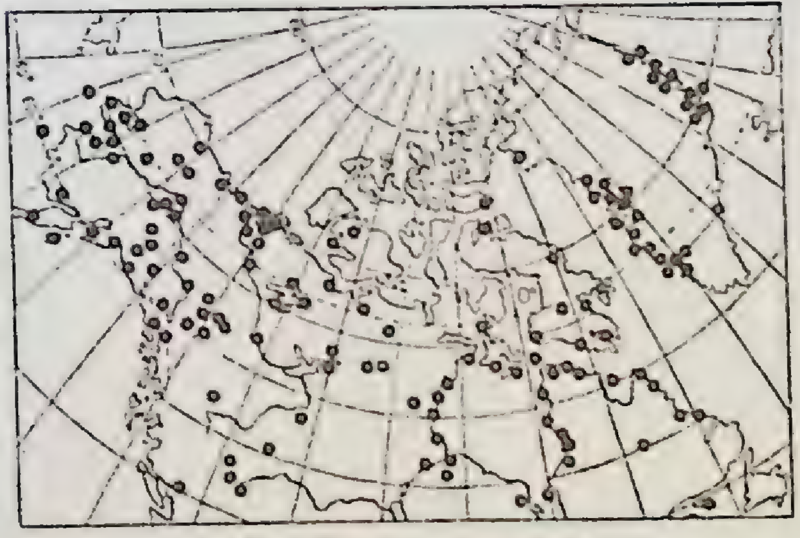
101. *Carex membranacea*



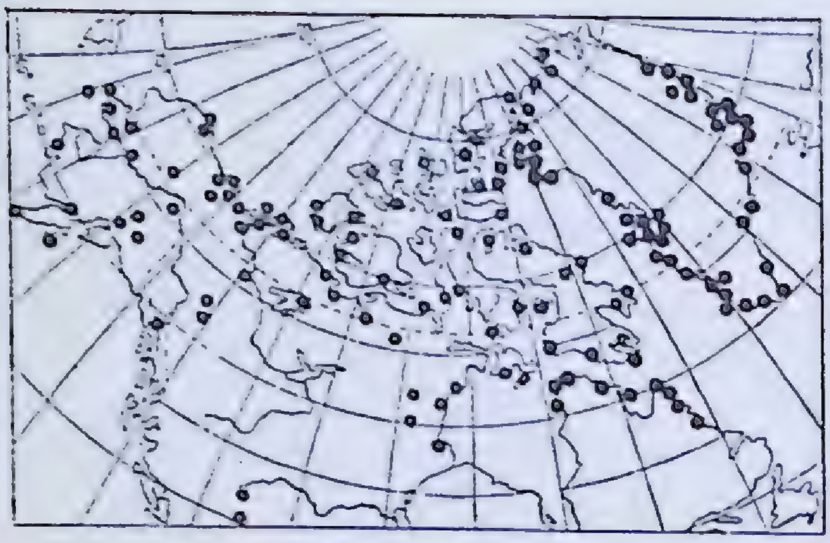
102. *Juncus balticus* var. *alaskanus*



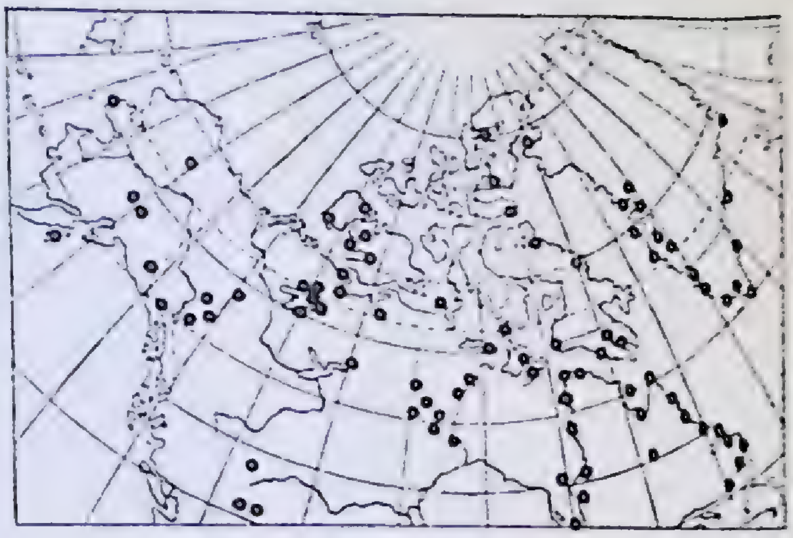
103. *Juncus arcticus*



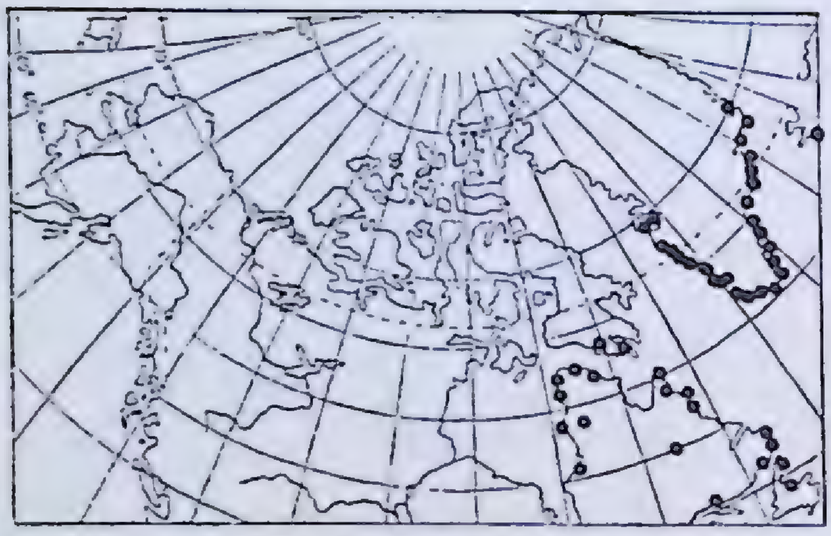
104. *Juncus castaneus*



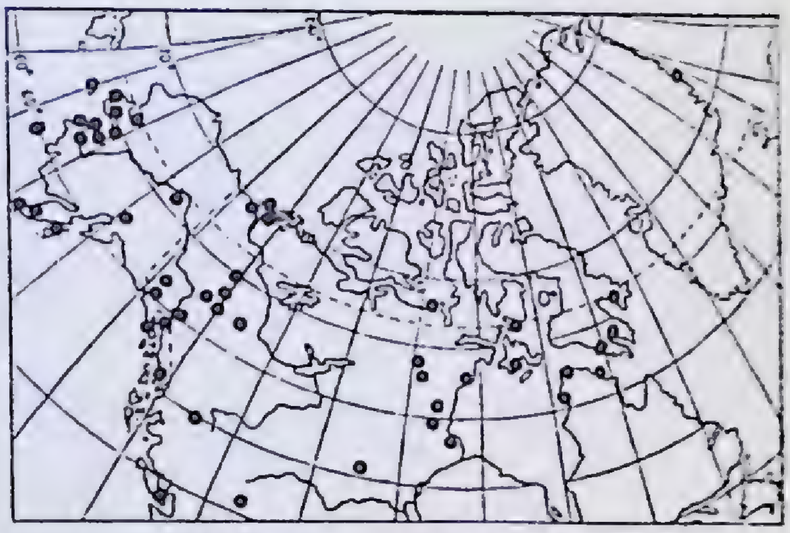
105. *Juncus biglumis*



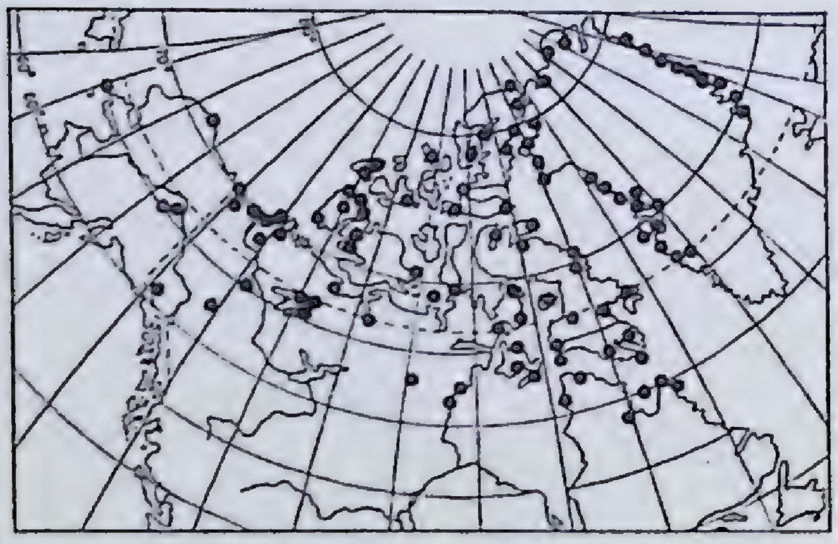
106. *Juncus albescens*



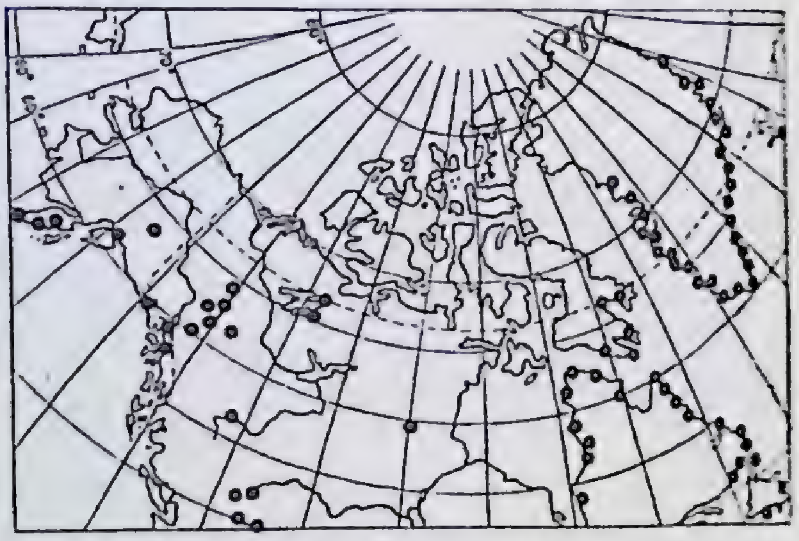
107. *Juncus trifidus*



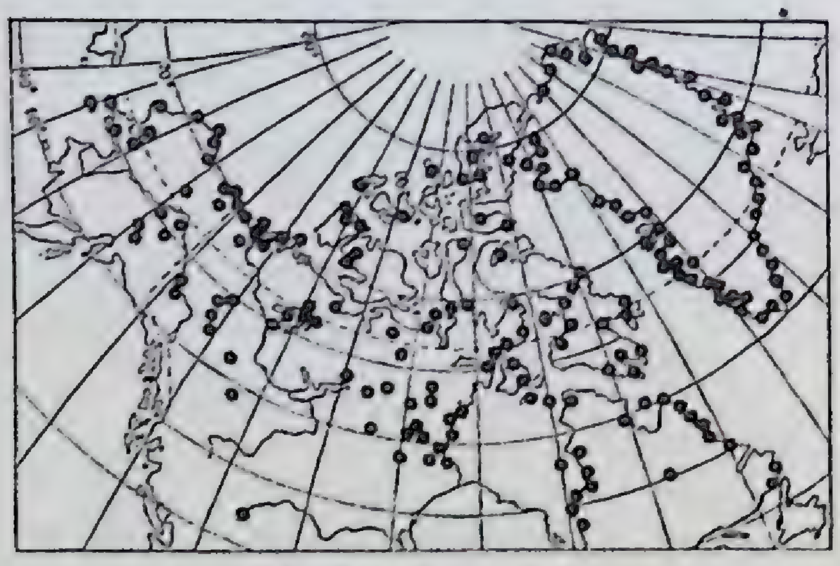
108. *Luzula Wahlenbergii*



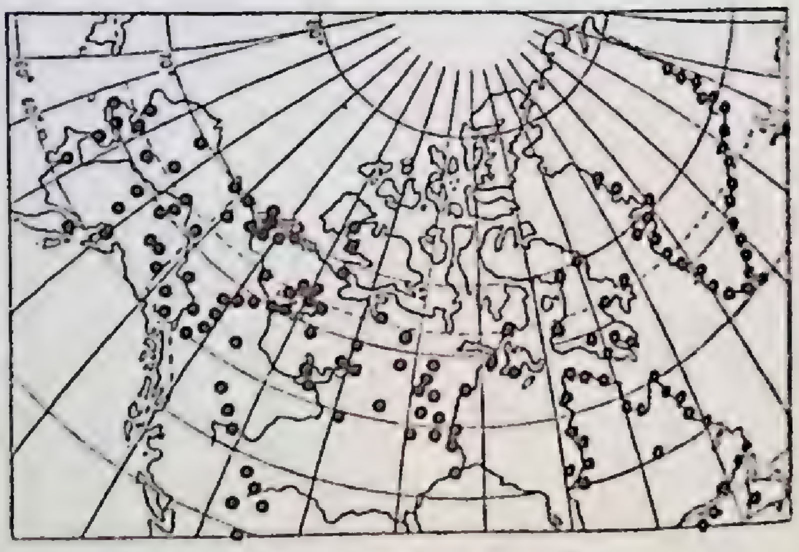
109. *Luzula nivalis*



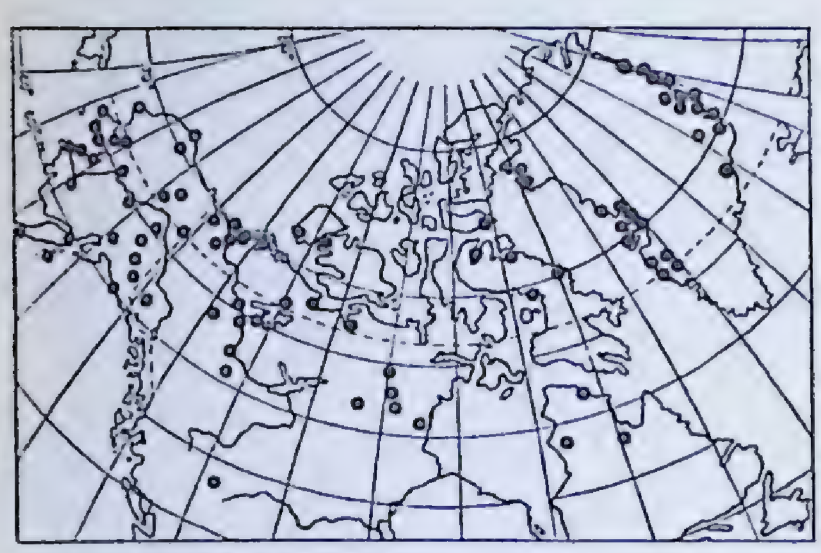
110. *Luzula spicata*

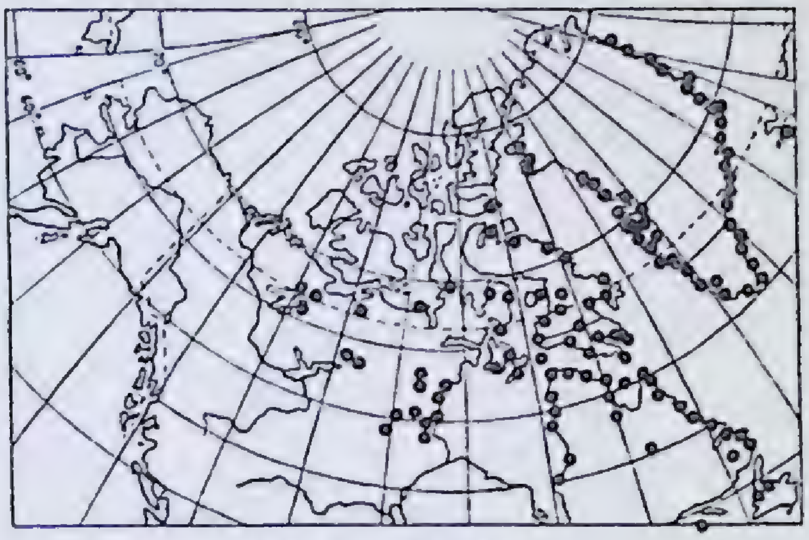


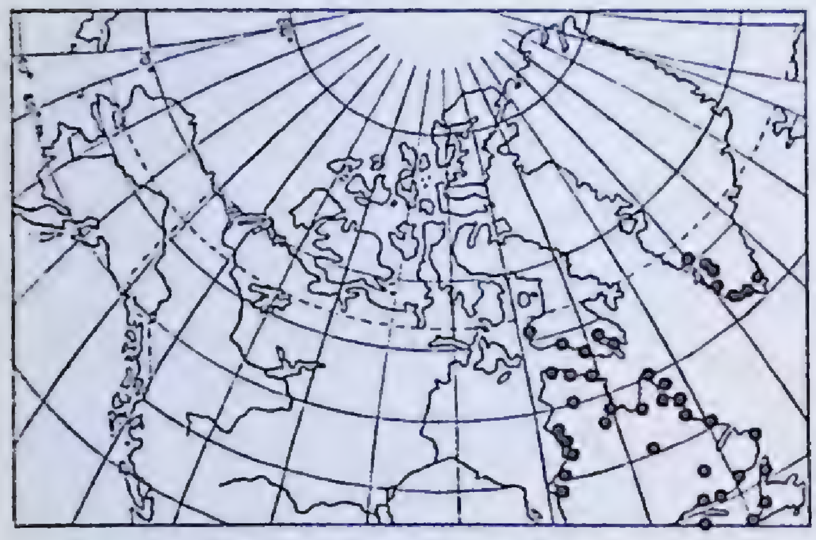
111. *Luzula confusa*

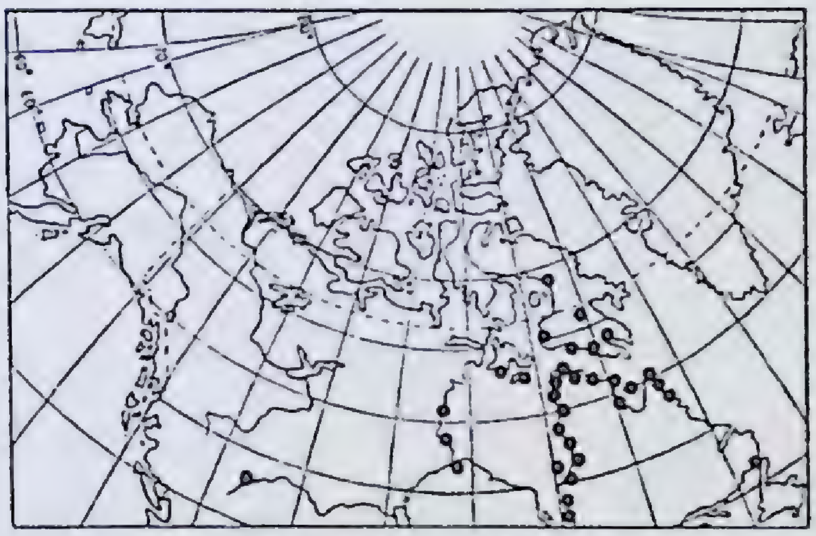


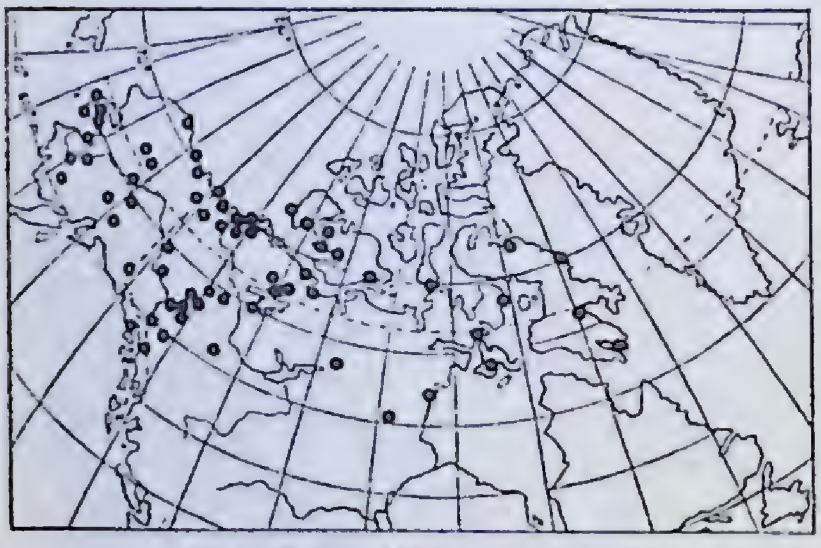
112. *Tofieldia pusilla*

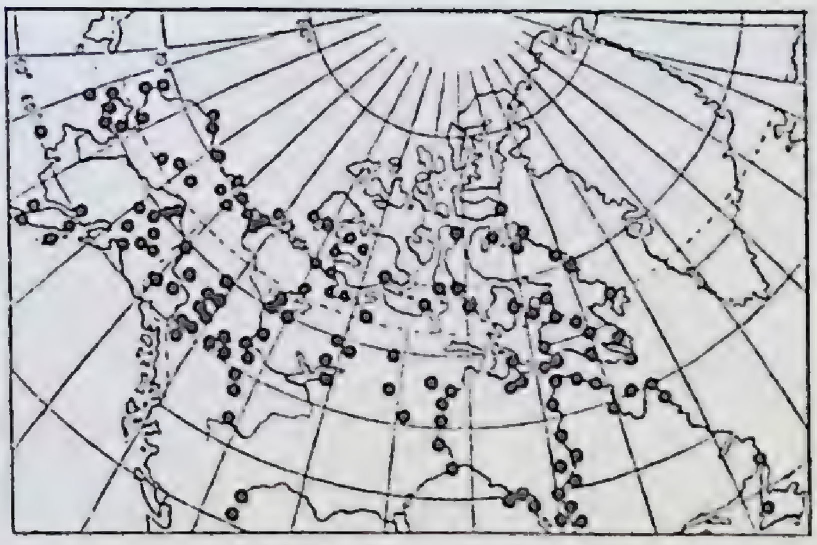

113. *Tofieldia coccinea*

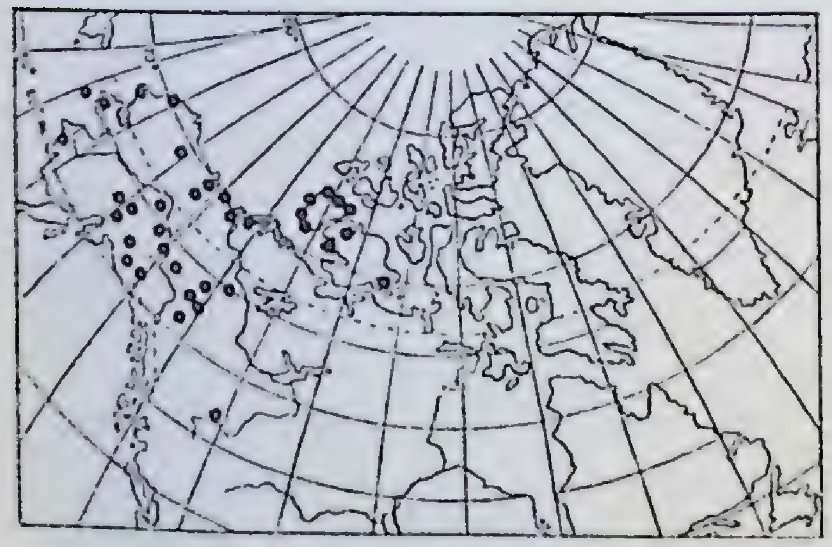

114. *Salix herbacea*

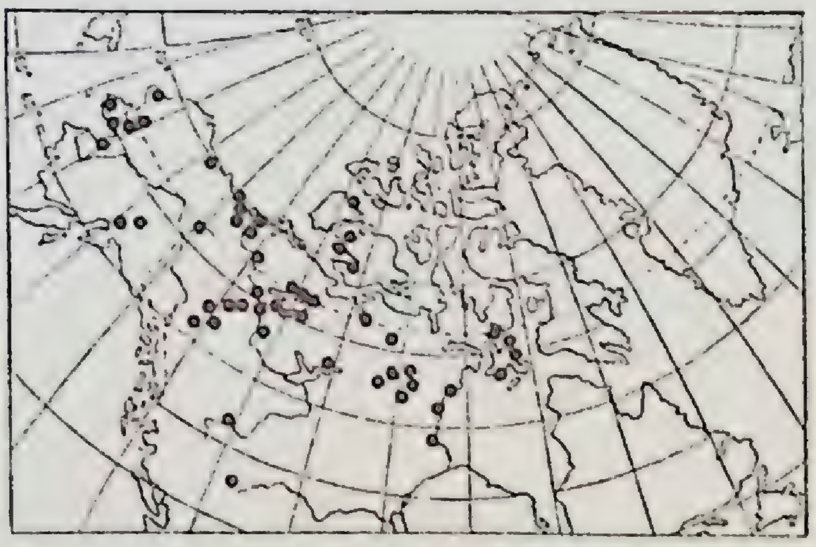

115. *Salix Uva-Ursi*

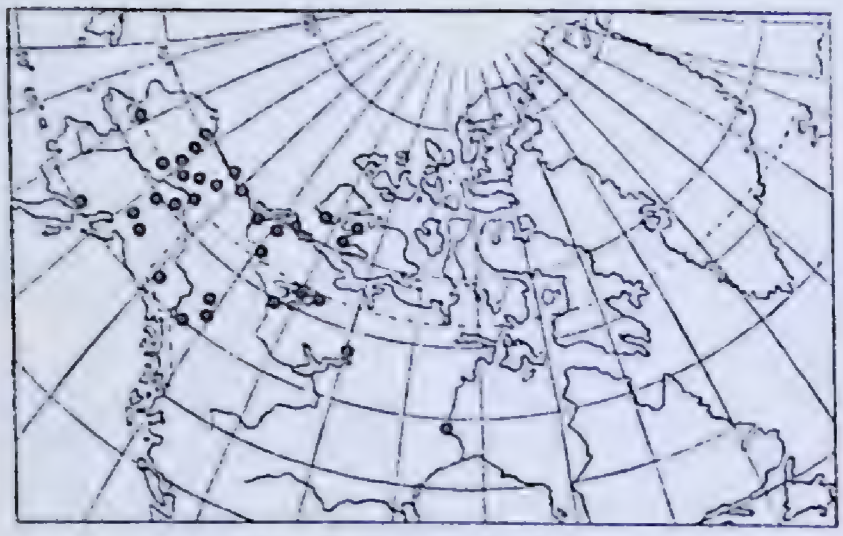

116. *Salix calcicola*


117. *Salix Richardsonii*

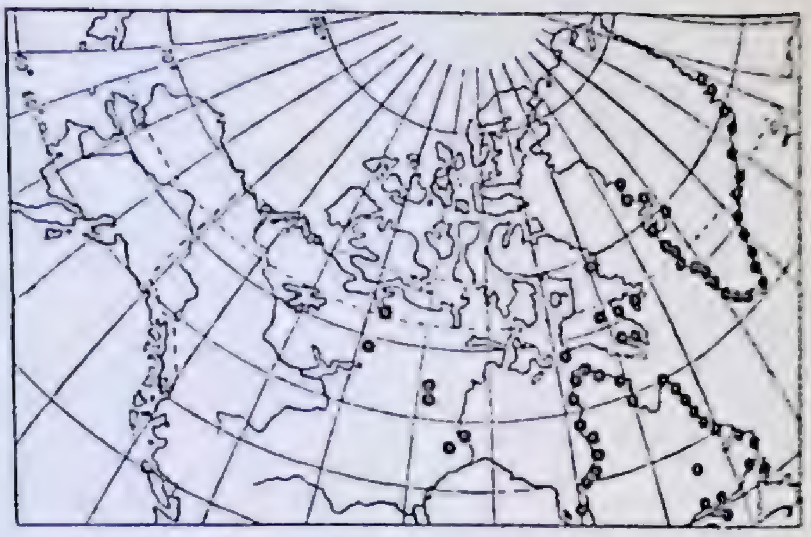

118. *Salix reticulata*


119. *Salix pseudopolaris*

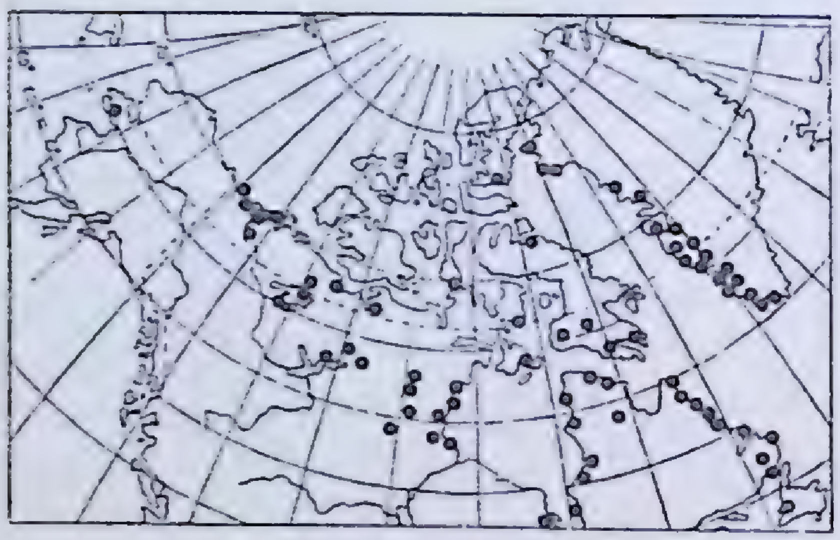

120. *Salix alaxensis*



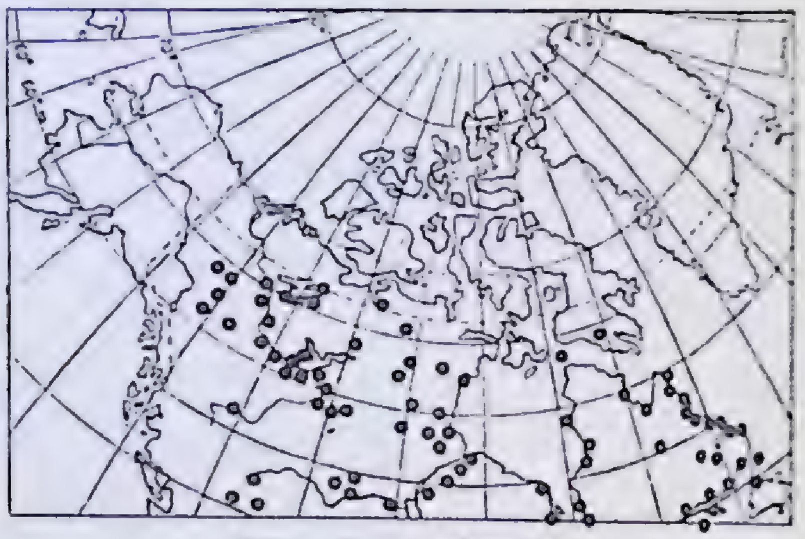
121. *Salix niphoclada*



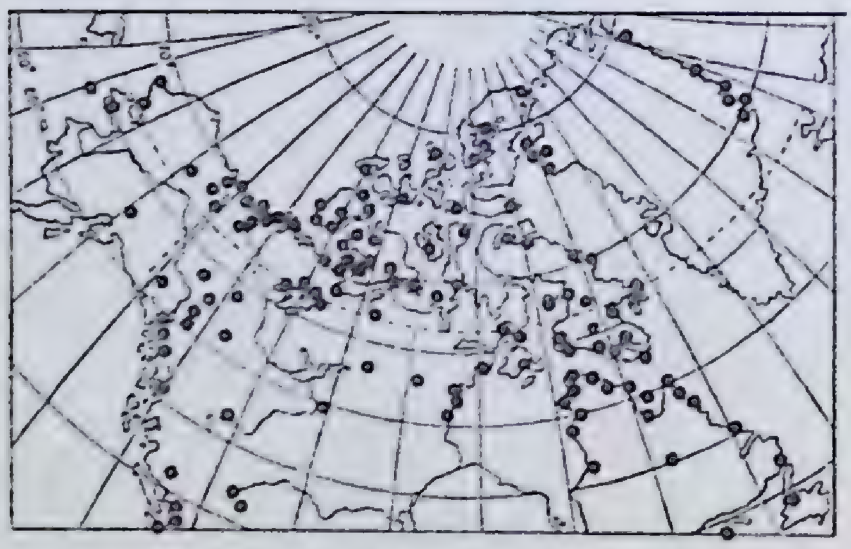
122. *Salix cordifolia* vars. *callicarpaca* and *intonsa*



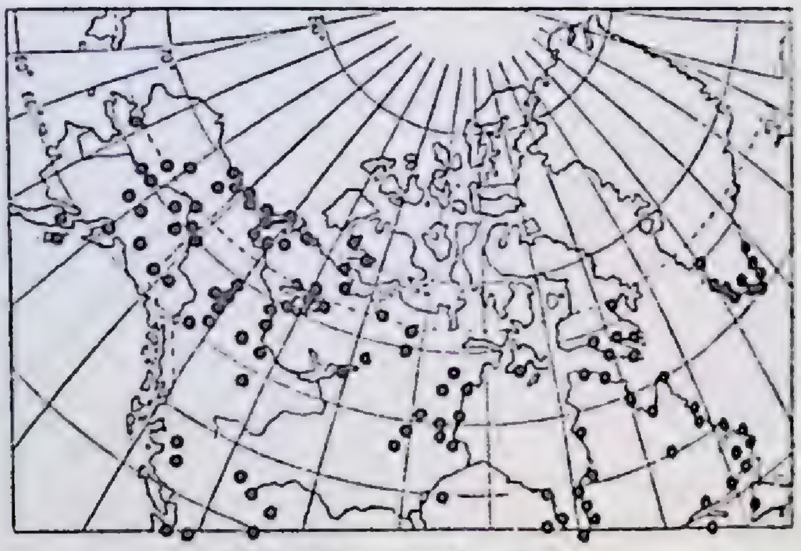
123. *Salix arctophila*



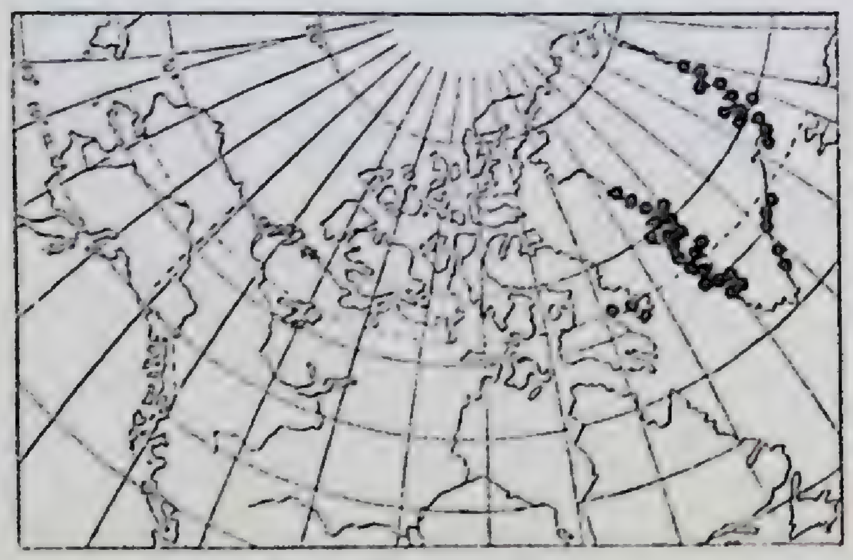
124. *Salix planifolia*



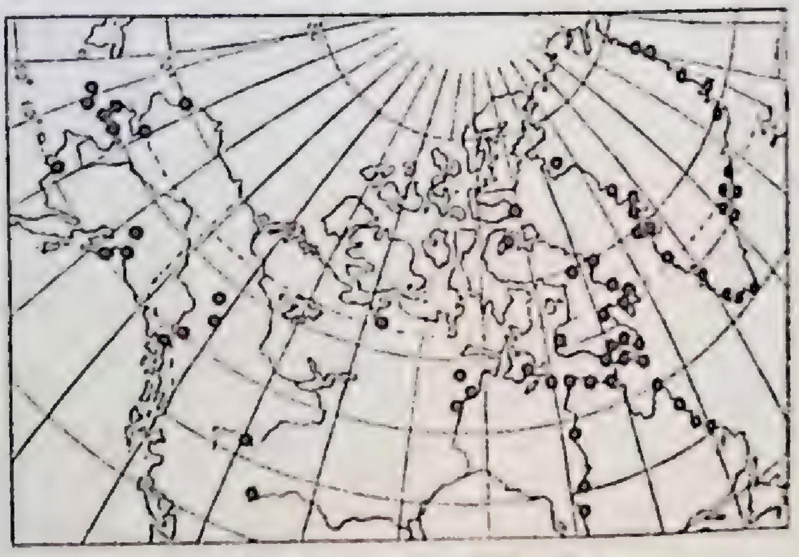
125. *Salix arctica* s. lat.



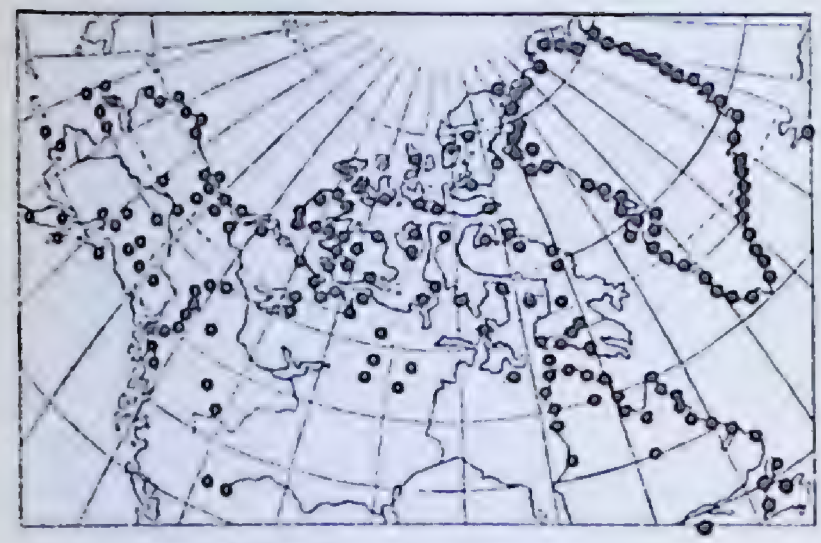
126. *Betula glandulosa*



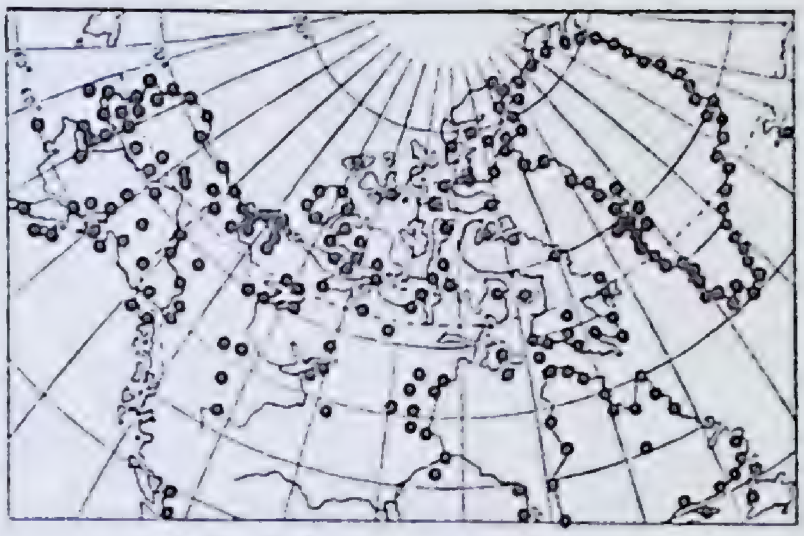
127. *Betula nana*



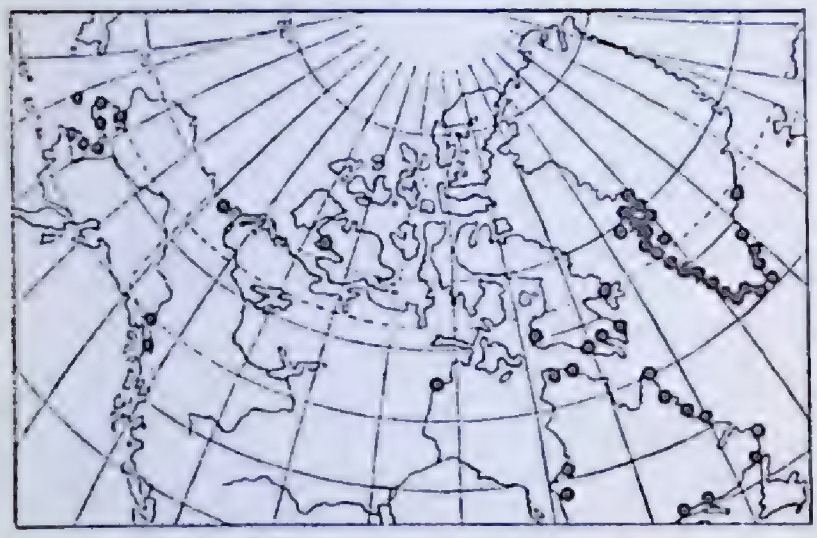
128. *Koenigia islandica*



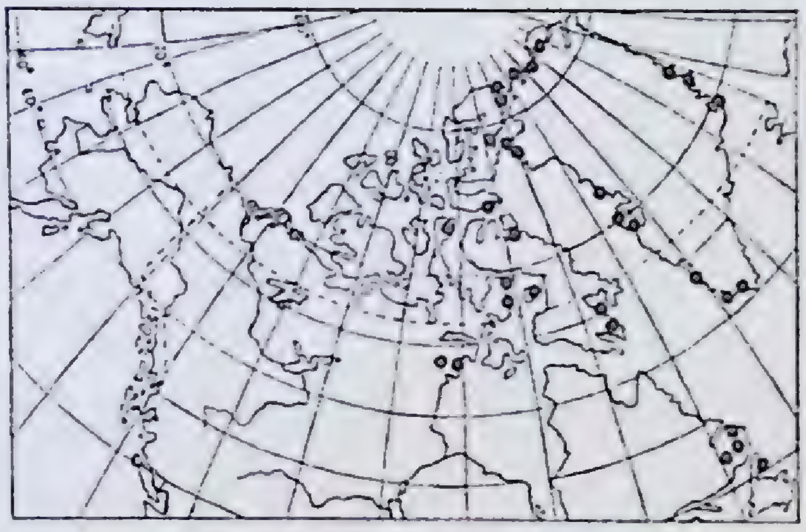
129. *Oxyria digyna*



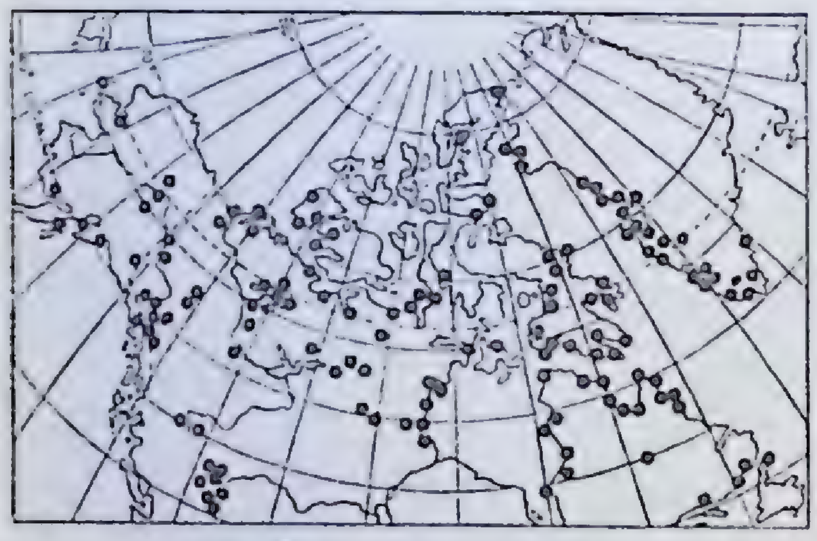
130. *Polygonum viviparum*



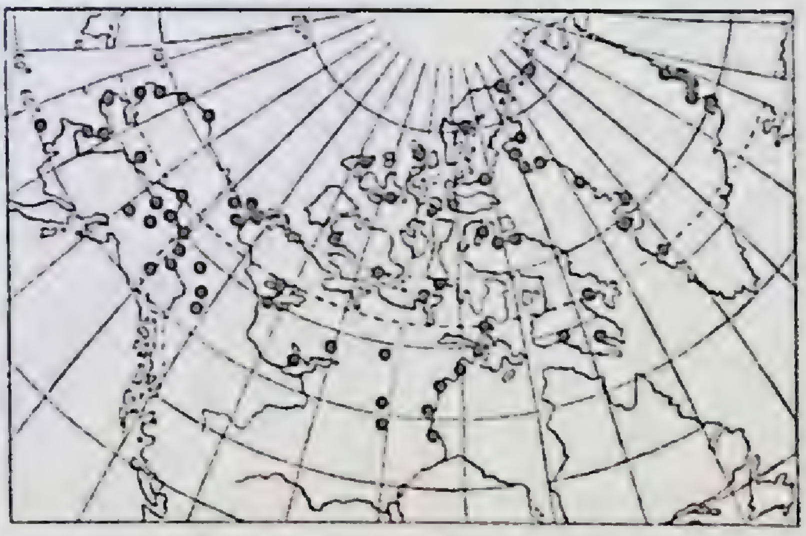
131. *Montia lamprosperma*



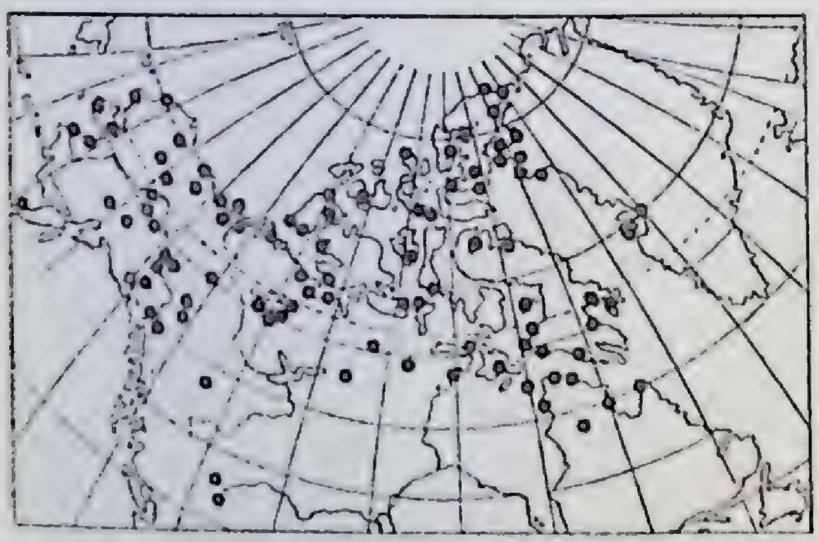
132. *Stellaria crassipes*



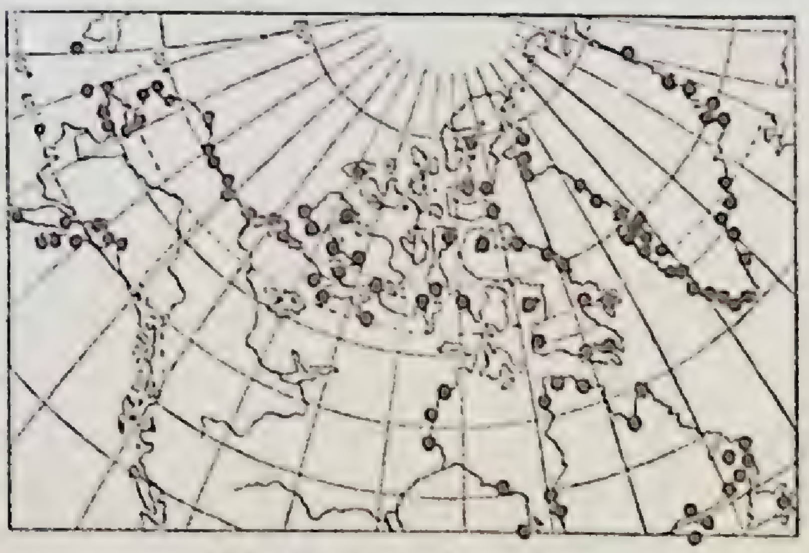
133. *Stellaria monantha*



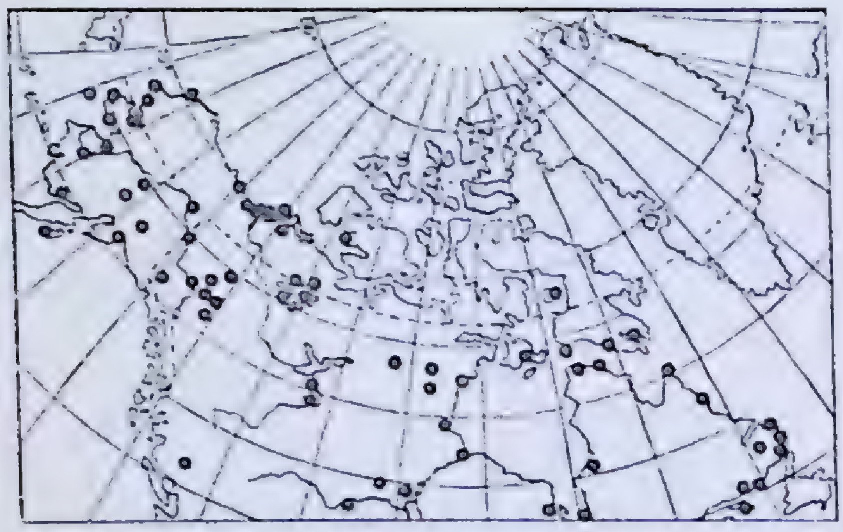
134. *Stellaria ciliatosepala*



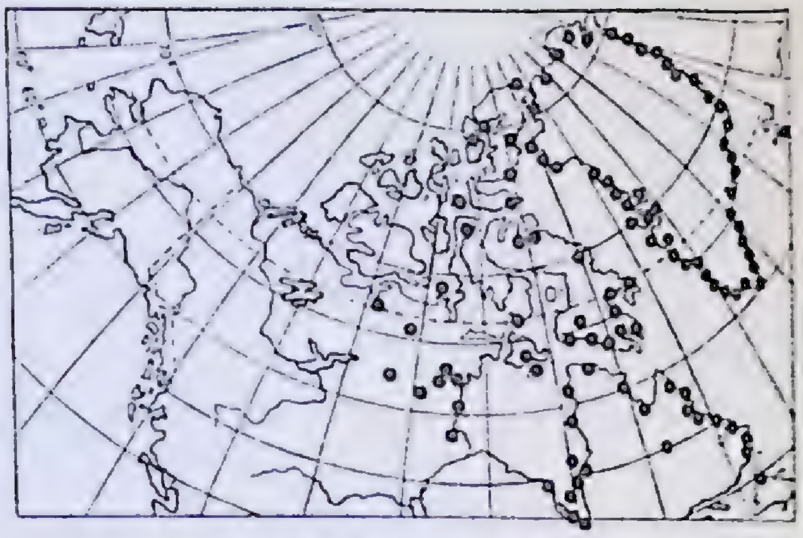
135. *Stellaria laeta*



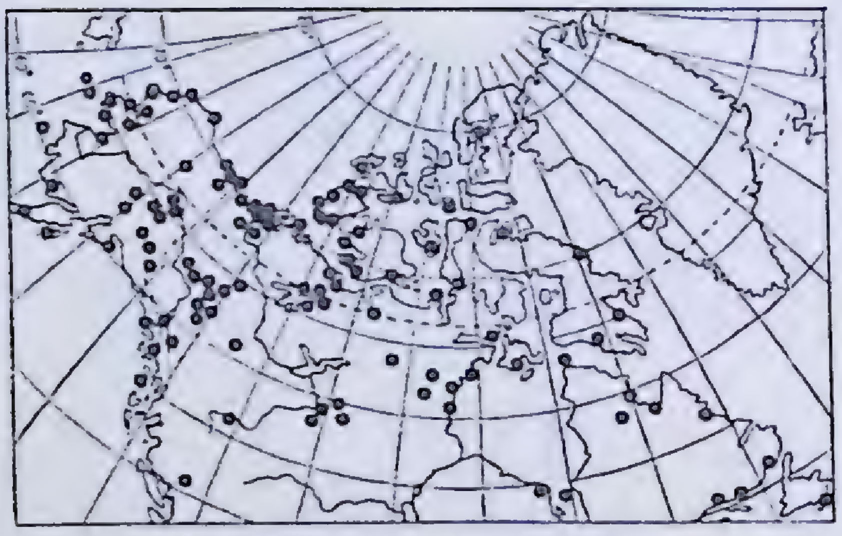
136. *Stellaria humifusa*



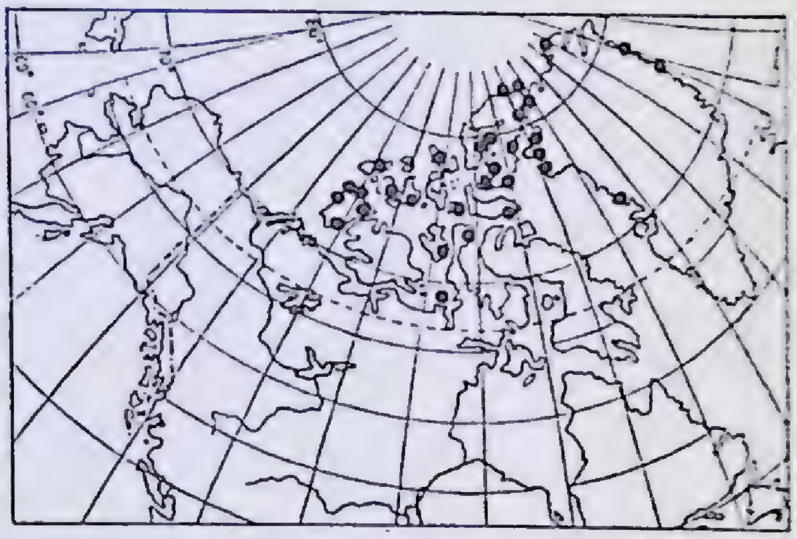
137. *Stellaria crassifolia*



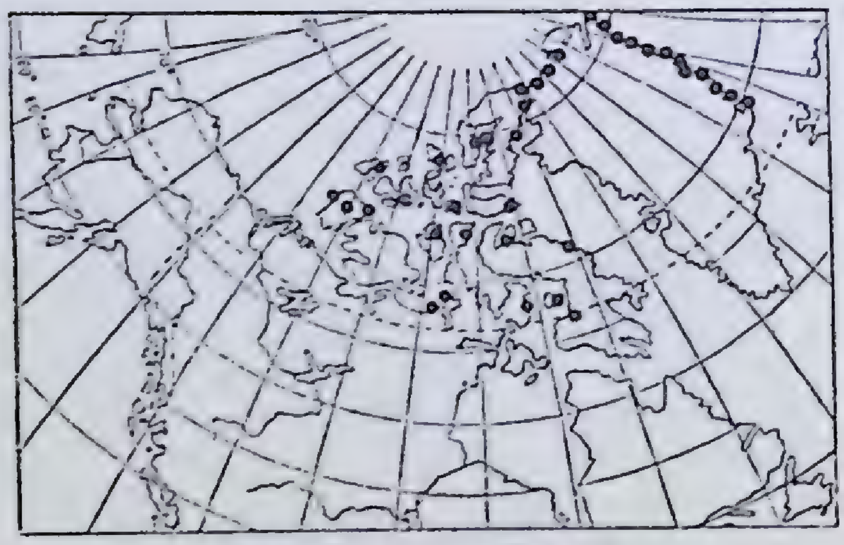
138. *Cerastium alpinum*



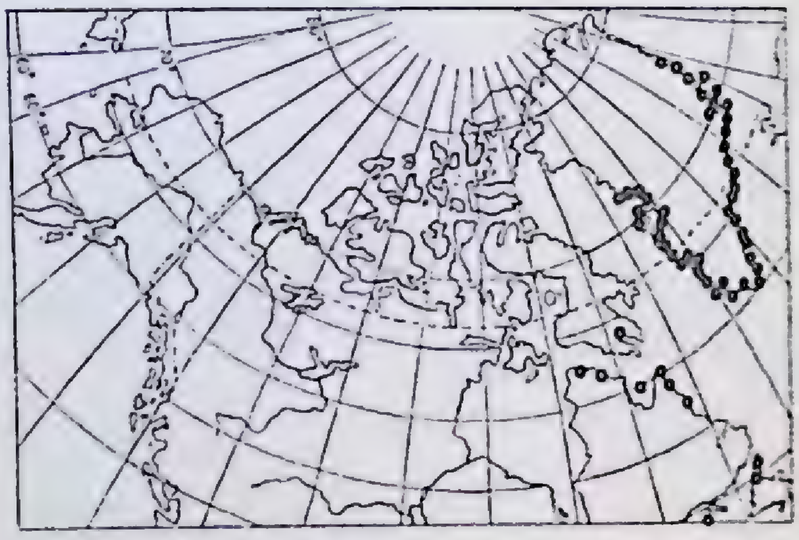
139. *Cerastium Beeringianum*



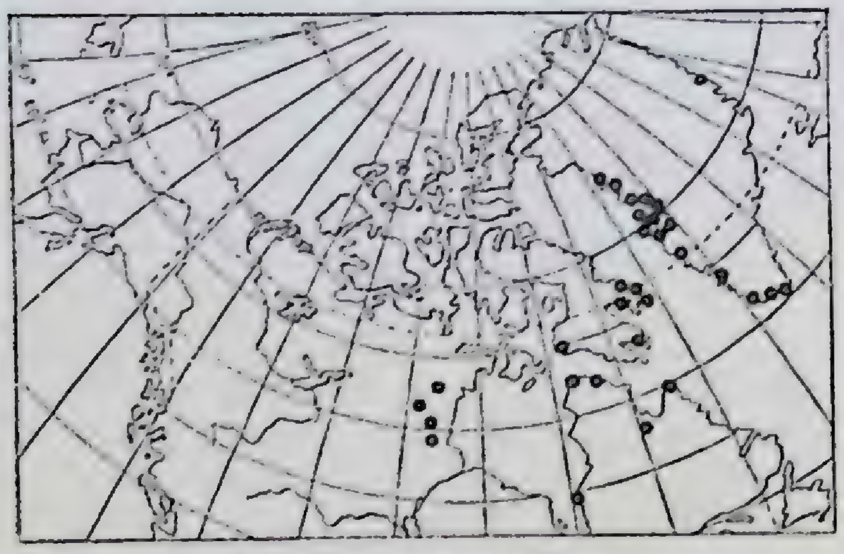
140. *Cerastium arcticum*



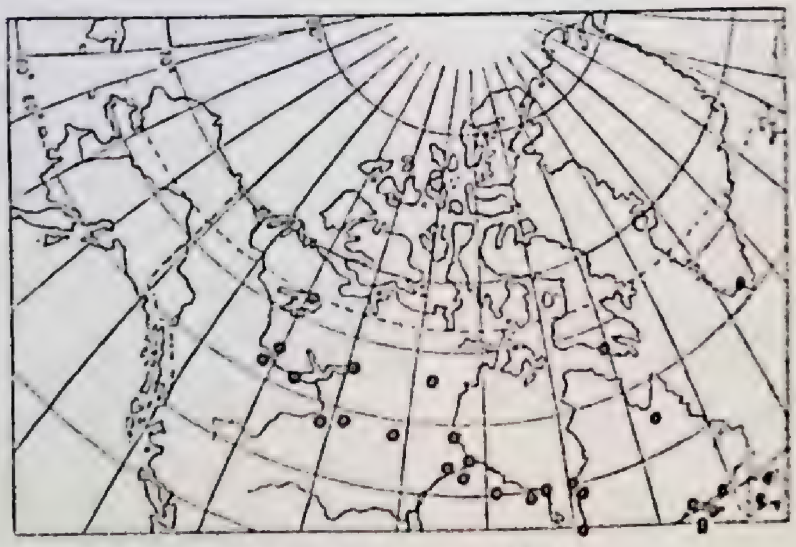
141. *Cerastium Regelii*



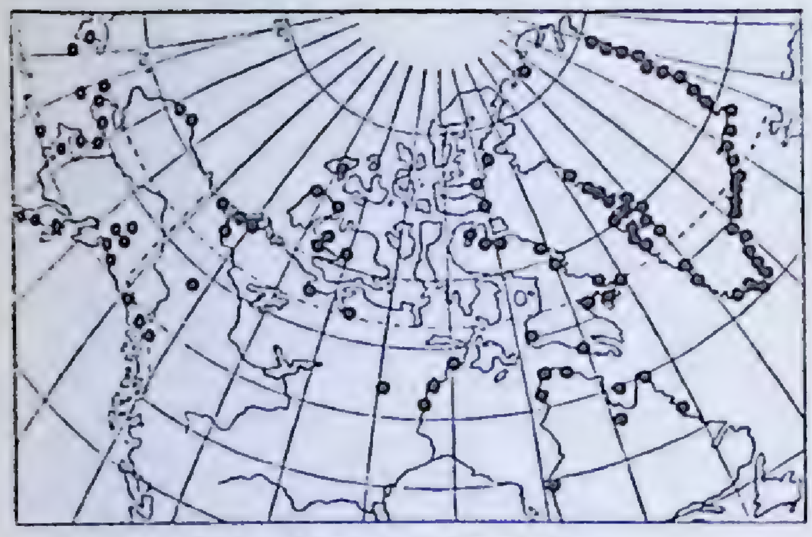
142. *Cerastium cerastoides*



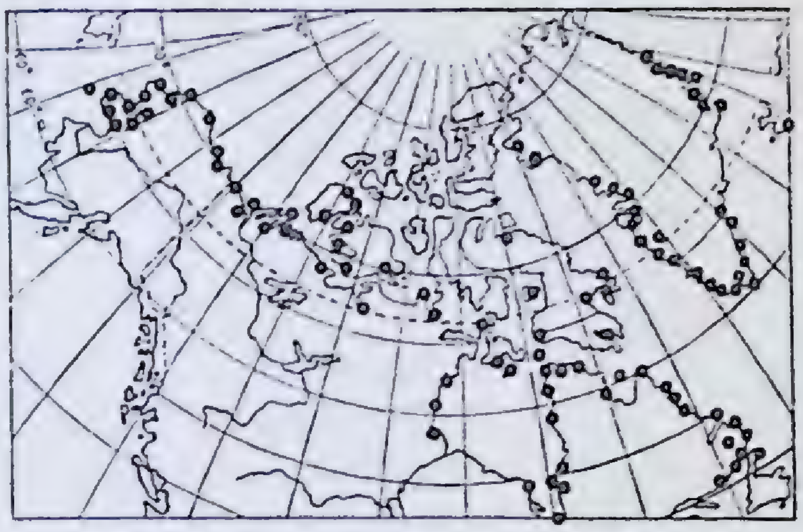
143. *Sagina caespitosa*



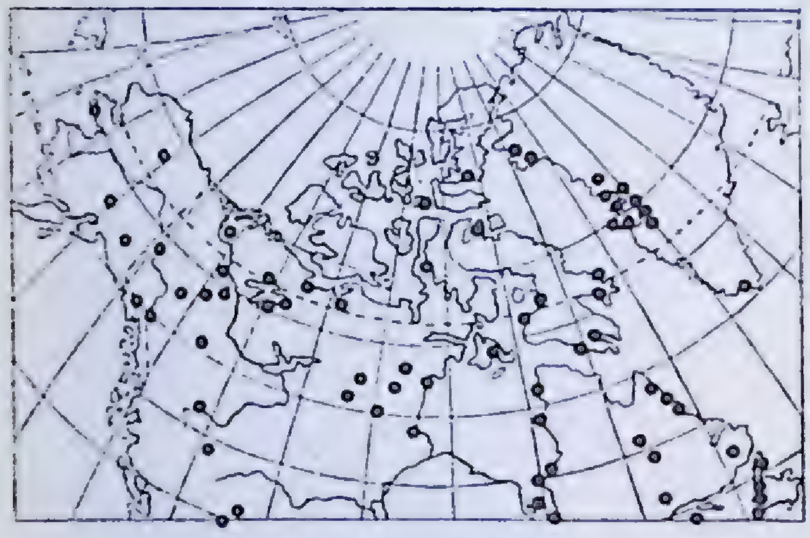
144. *Sagina nodosa*



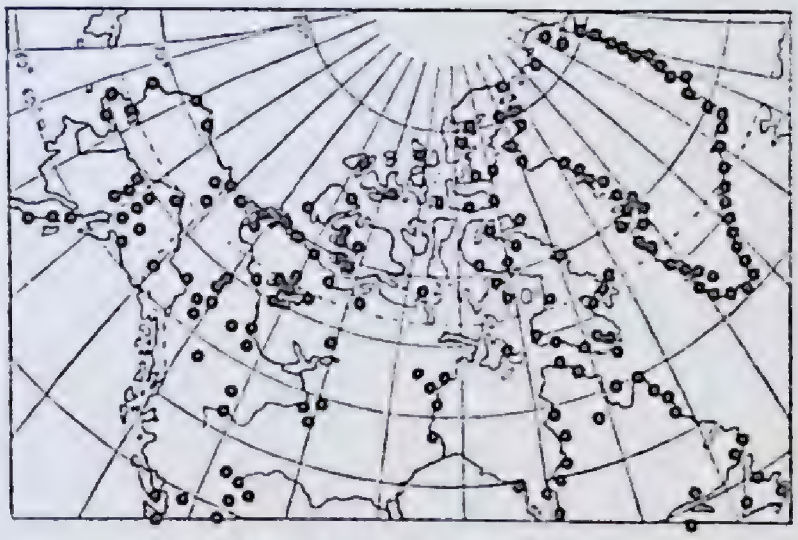
145. *Sagina intermedia*



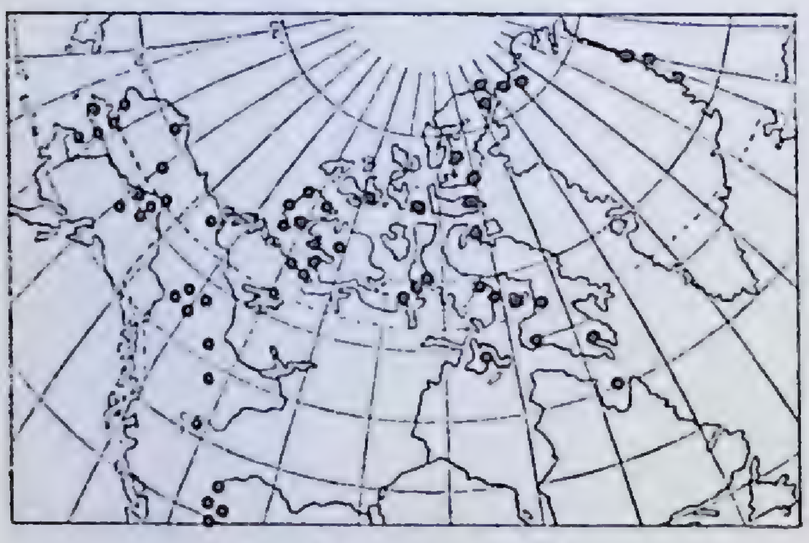
146. *Arenaria peploides* var. *diffusa*



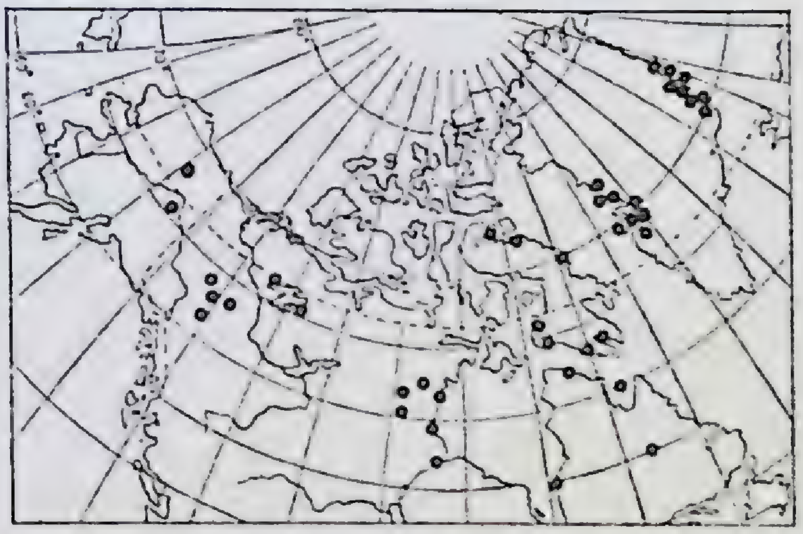
147. *Arenaria humifusa*



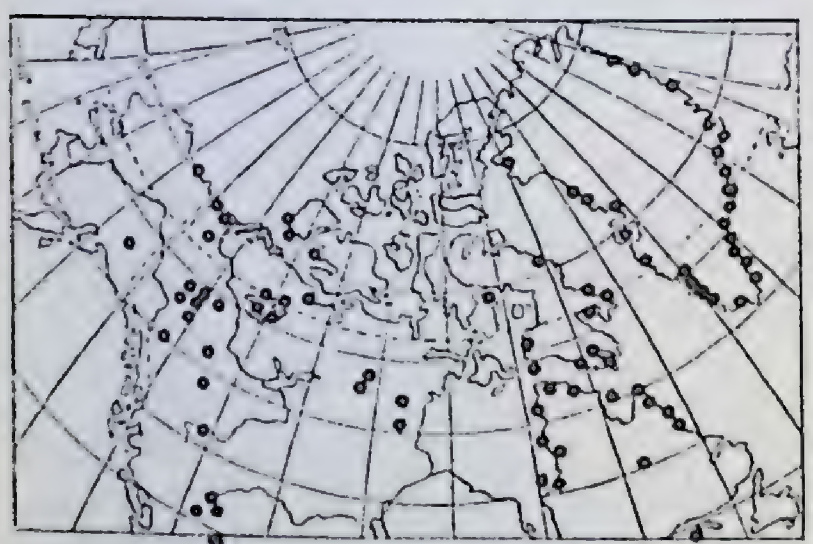
148. *Arenaria rubella*



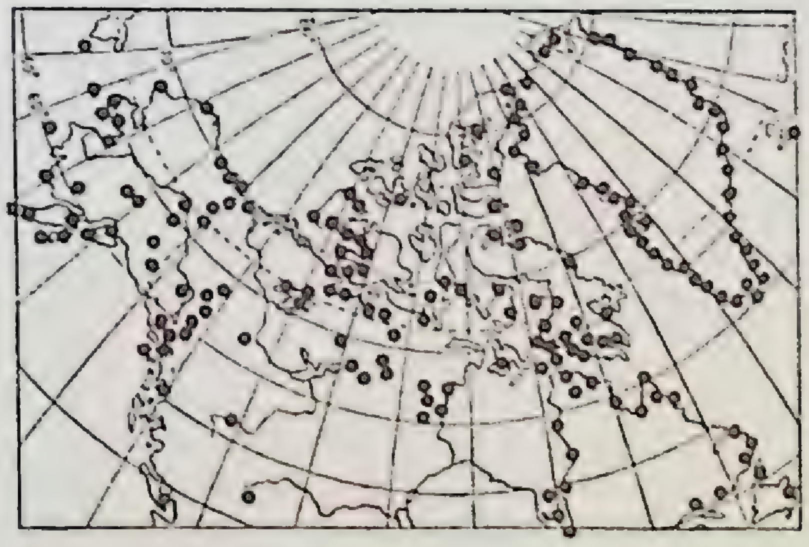
149. *Arenaria Rossii*



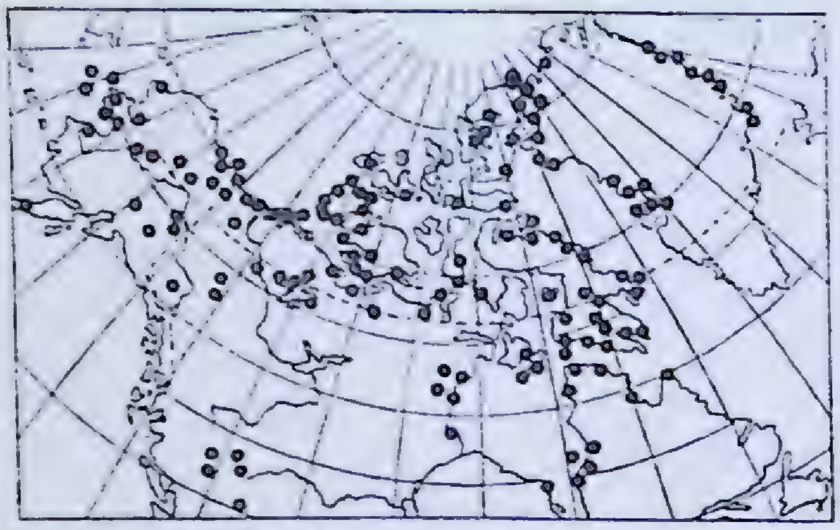
150. *Arenaria uliginosa*



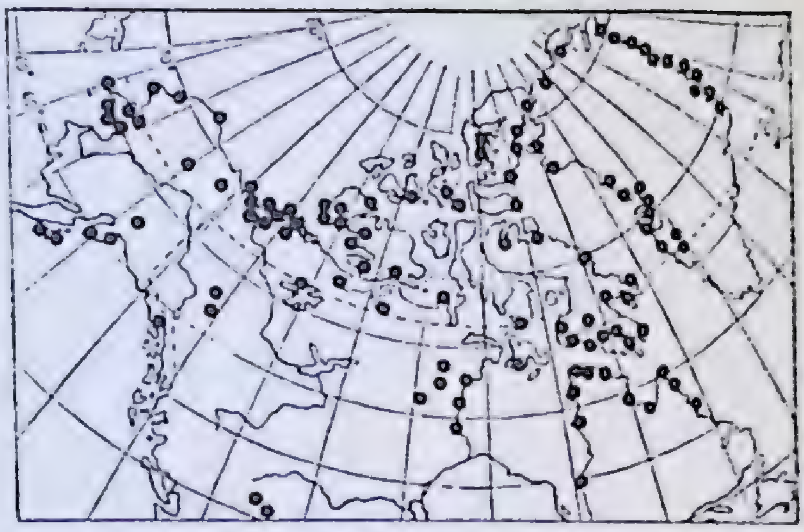
151. *Arenaria sajanensis*



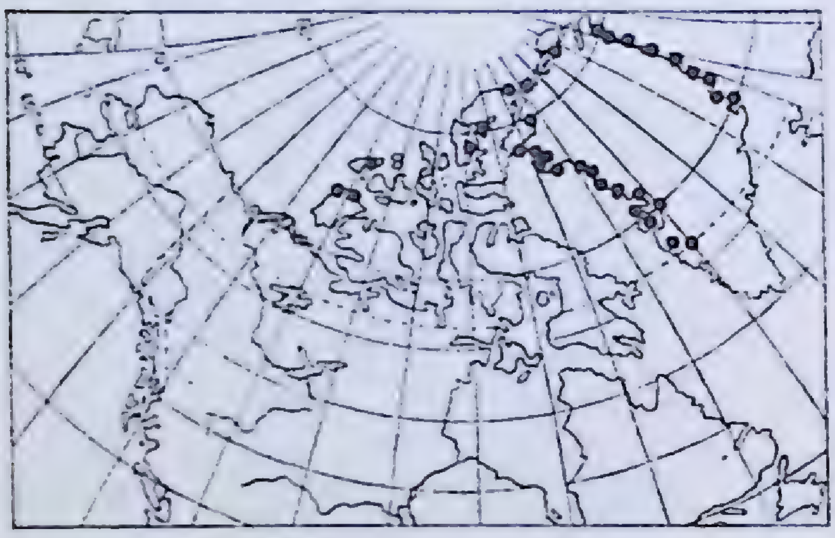
152. *Silene acaulis* var. *exscapa*



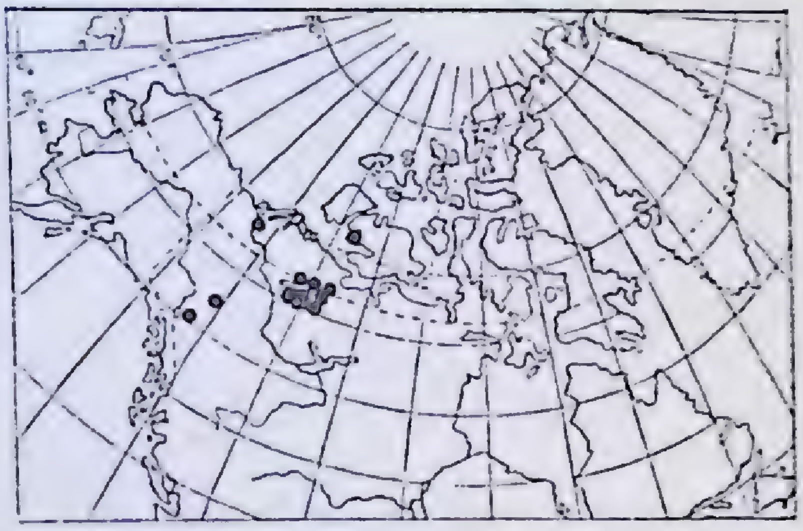
153. *Melandrium apetalum* ssp. *arcticum*



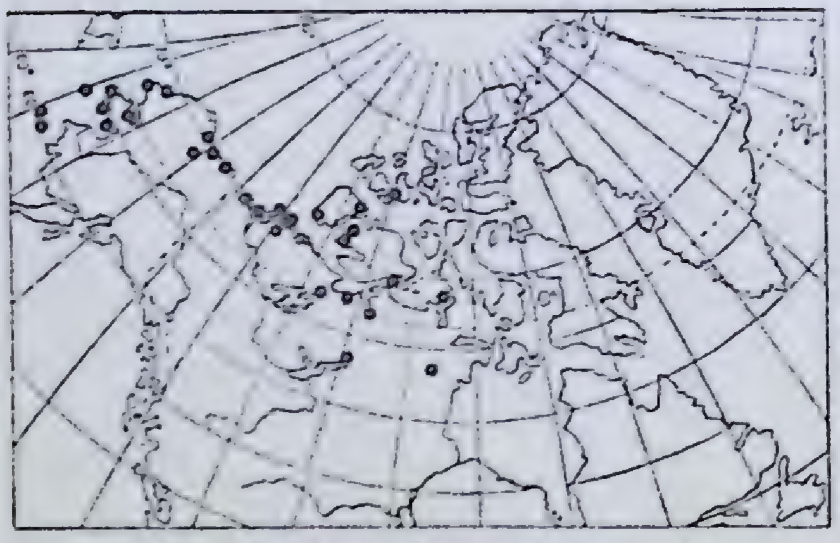
154. *Melandrium affine*



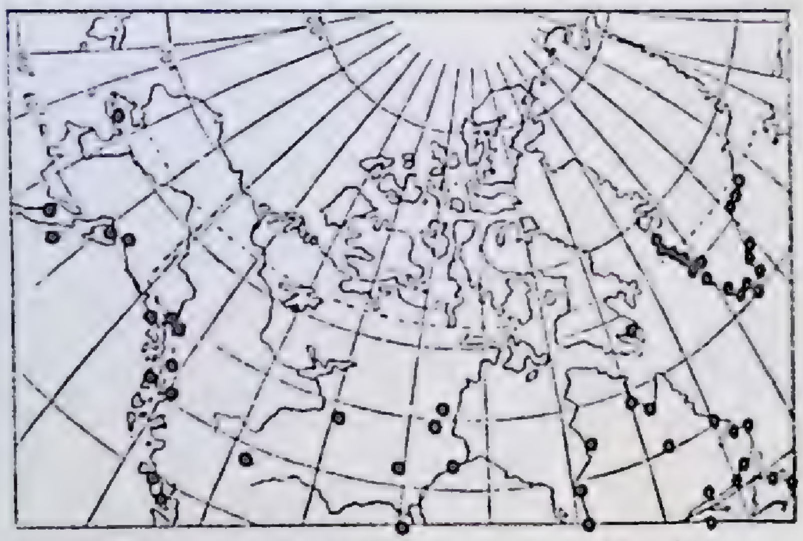
155. *Melandrium triflorum*



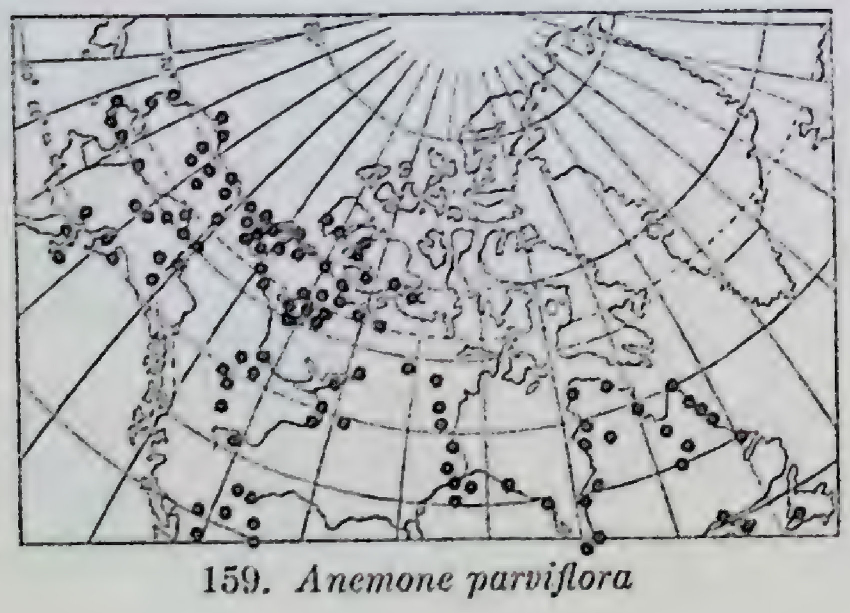
156. *Melandrium Ostenfeldii*



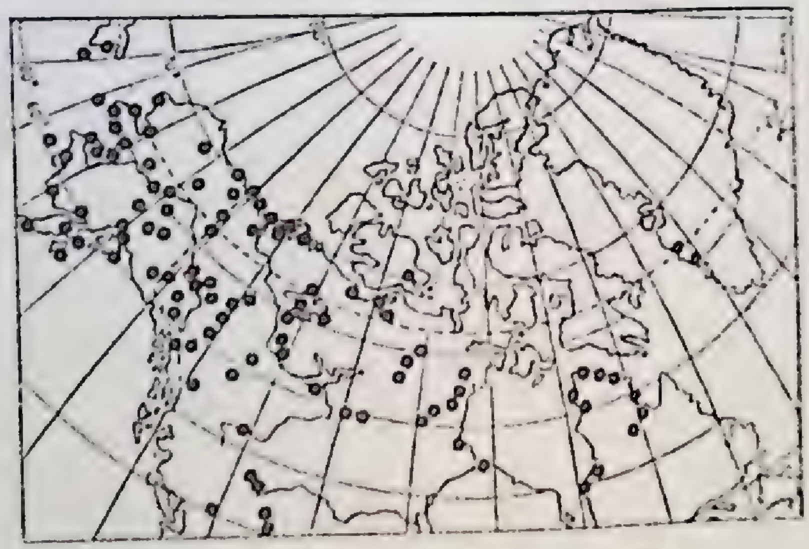
157. *Caltha palustris* var. *arctica*



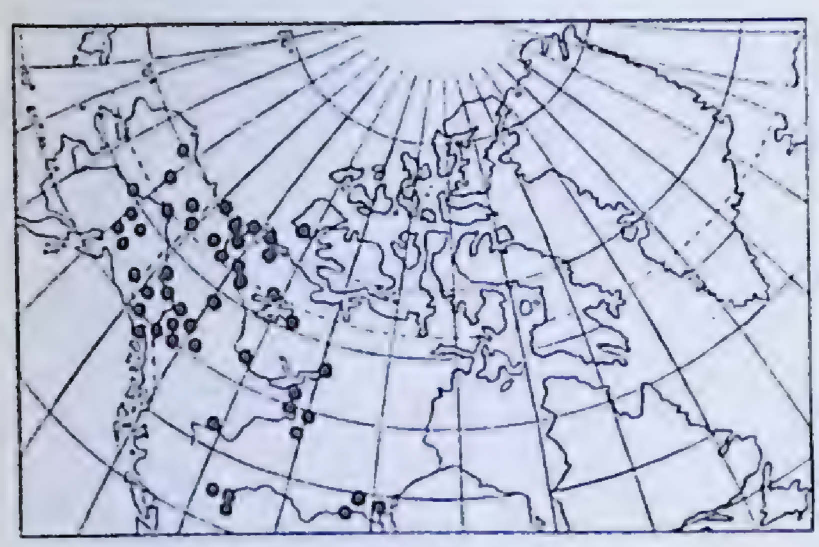
158. *Coptis trifolia* ssp. *groenlandica*



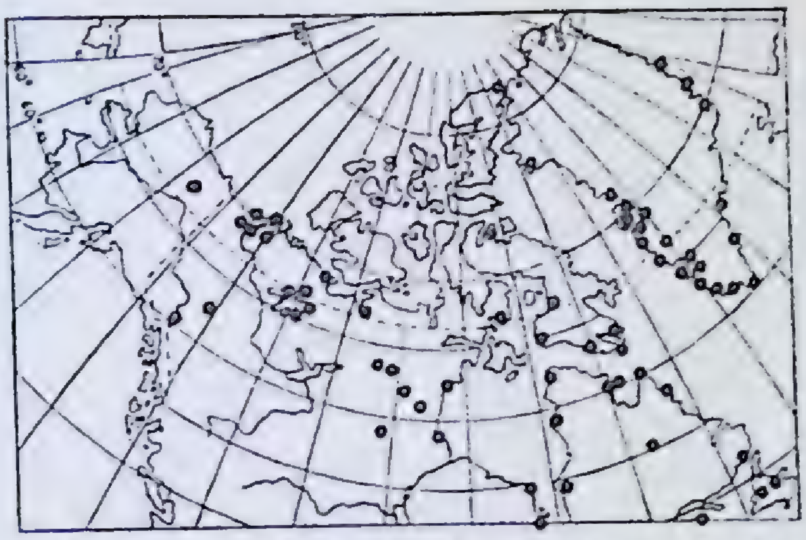
159. *Anemone parviflora*



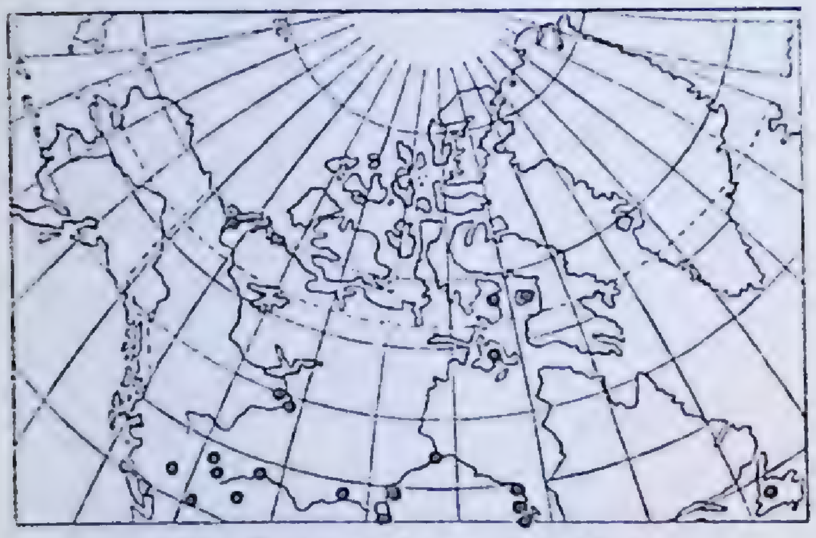
160. *Anemone Richardsonii*



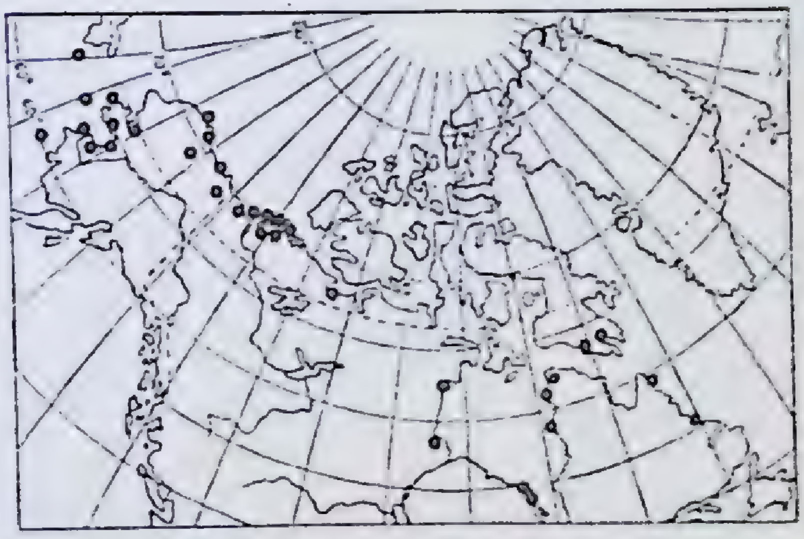
161. *Pulsatilla Ludoviciana*



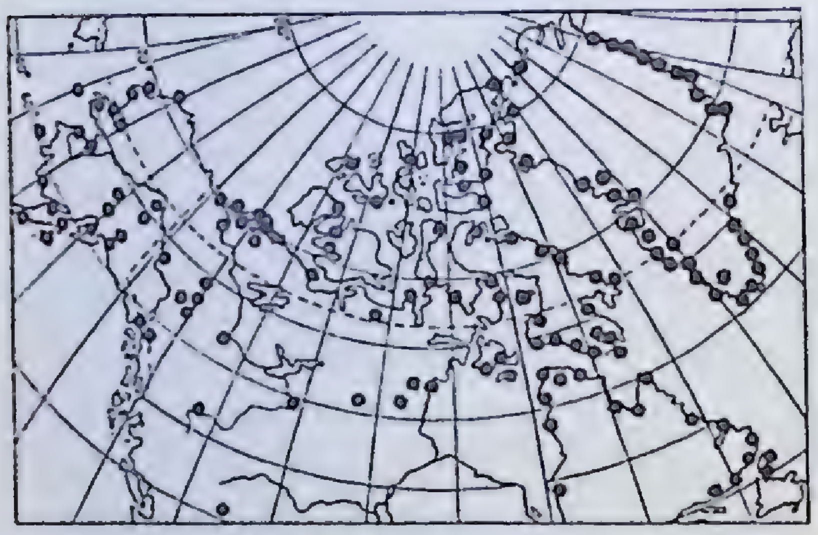
162. *Ranunculus trichophyllus* var. *eradicatus*



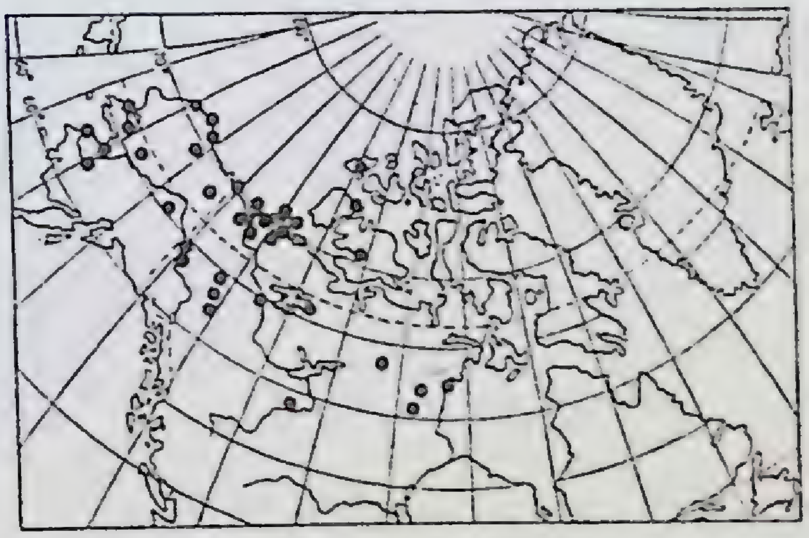
163. *Ranunculus subrigidus*



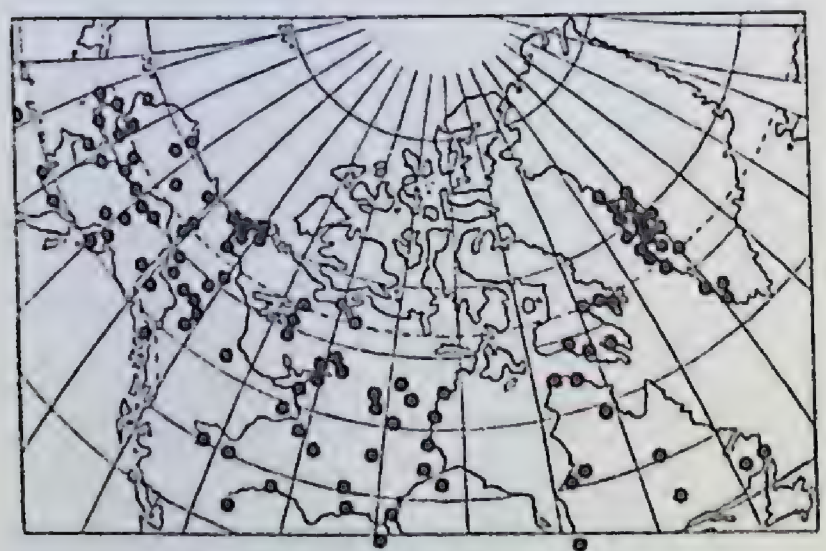
164. *Ranunculus Pallasii*



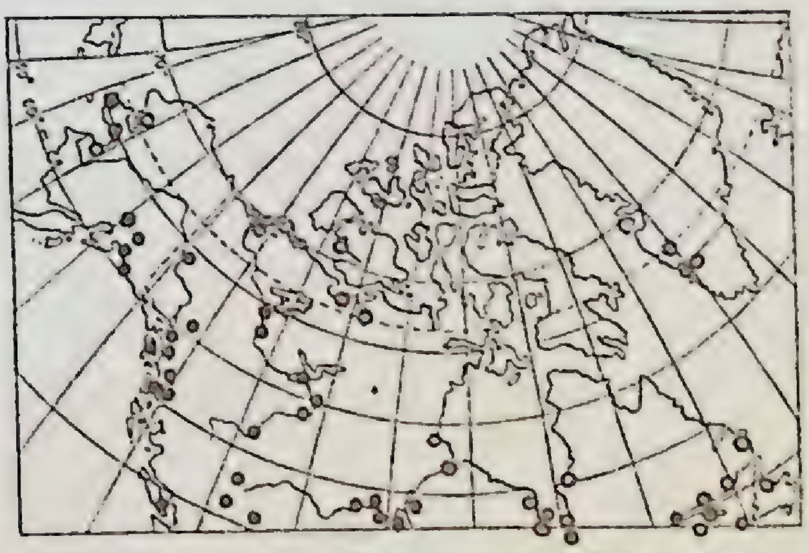
165. *Ranunculus hyperboreus*



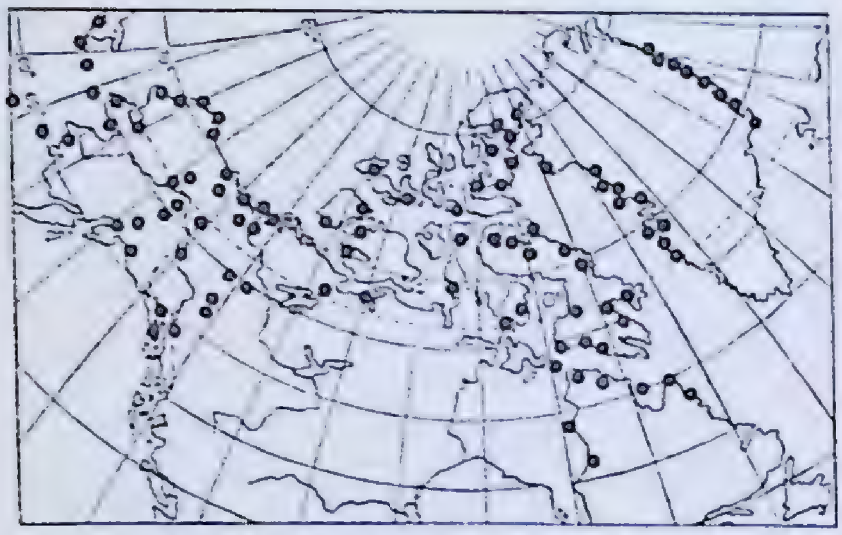
166. *Ranunculus Gmelini*



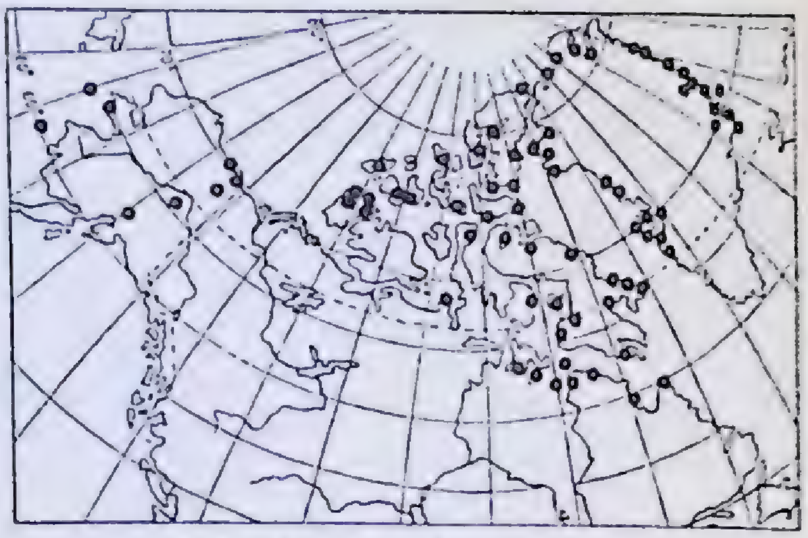
167. *Ranunculus lapponicus*



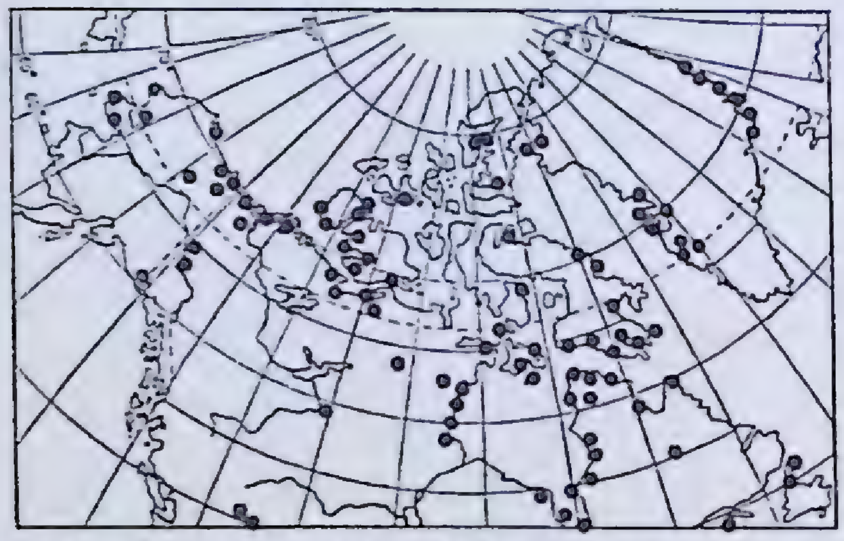
168. *Ranunculus Cymbalaria* (solid circles)
var. *alpinus* (open circles)



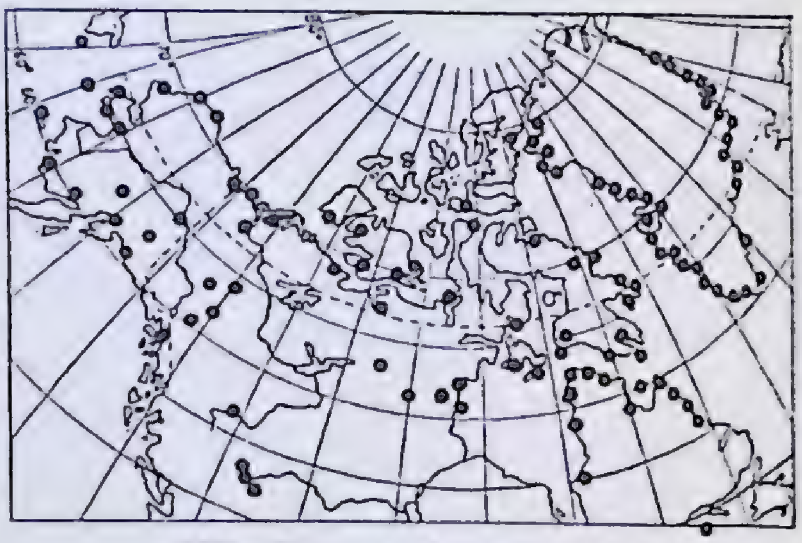
169. *Ranunculus nivalis*



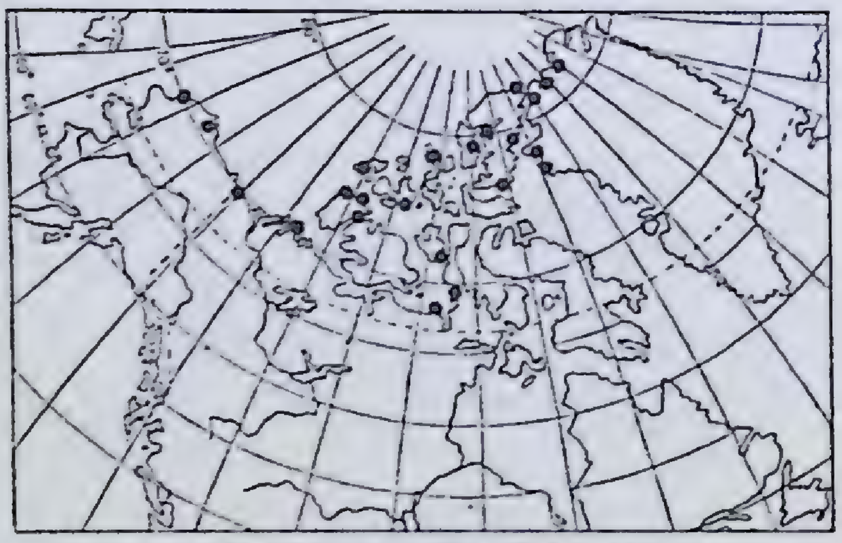
170. *Ranunculus sulphureus*



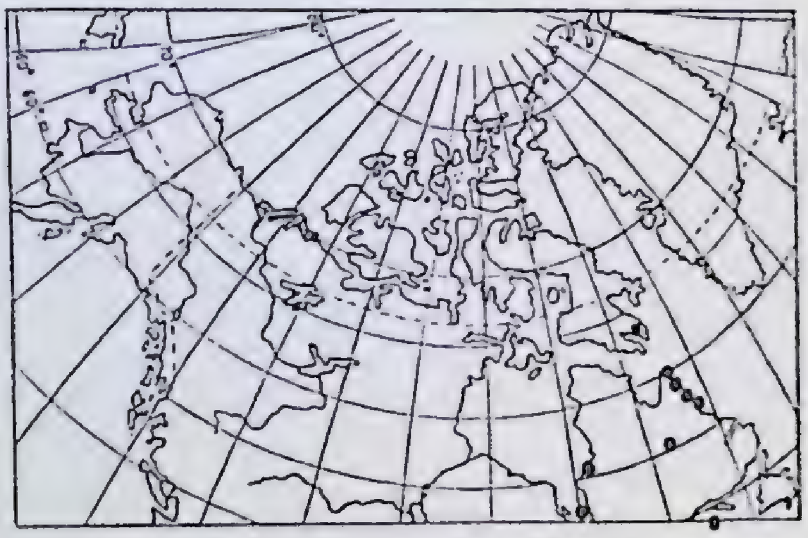
171. *Ranunculus pedatifidus* var. *leiocarpus*



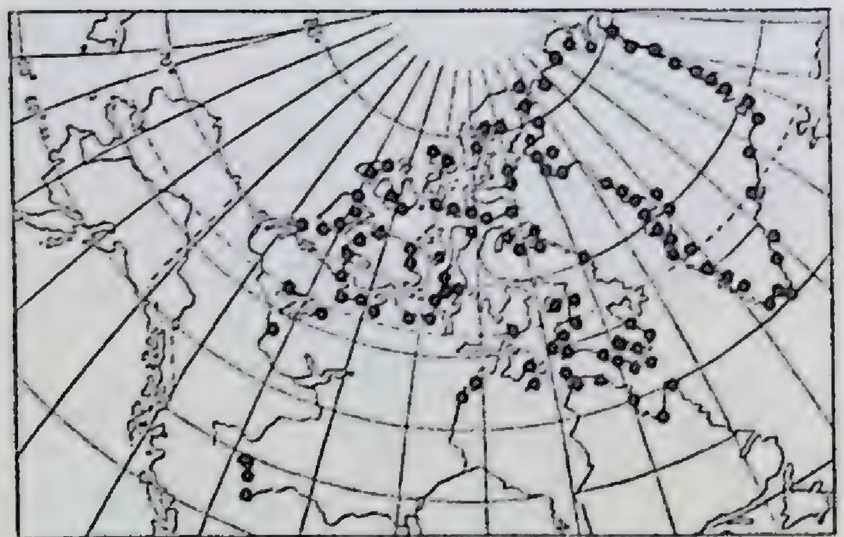
172. *Ranunculus pygmaeus*



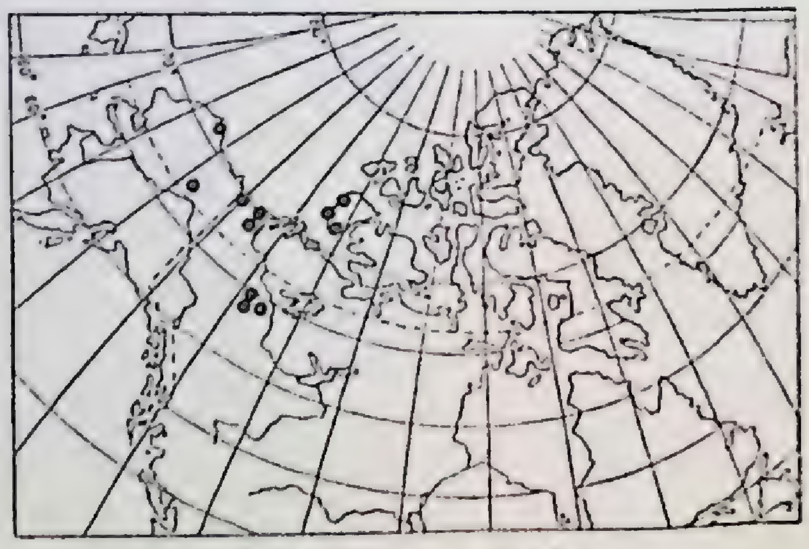
173. *Ranunculus Sabinei*



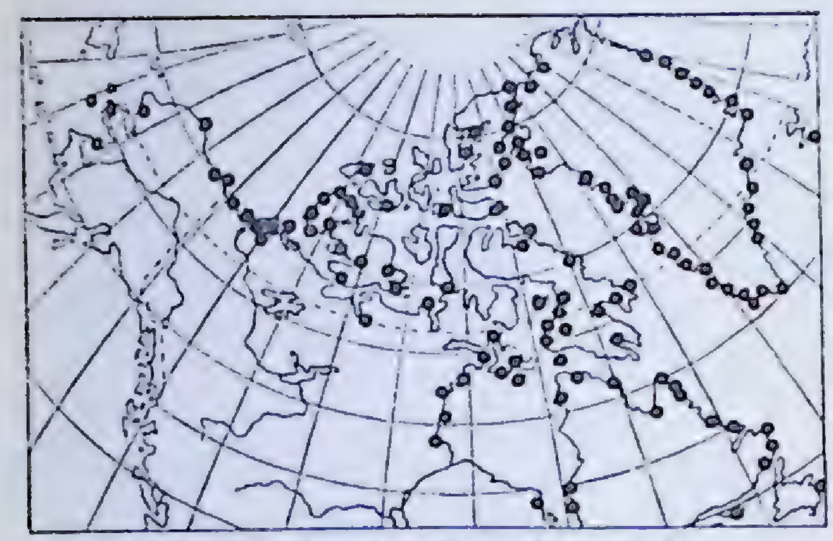
174. *Ranunculus Allenii*

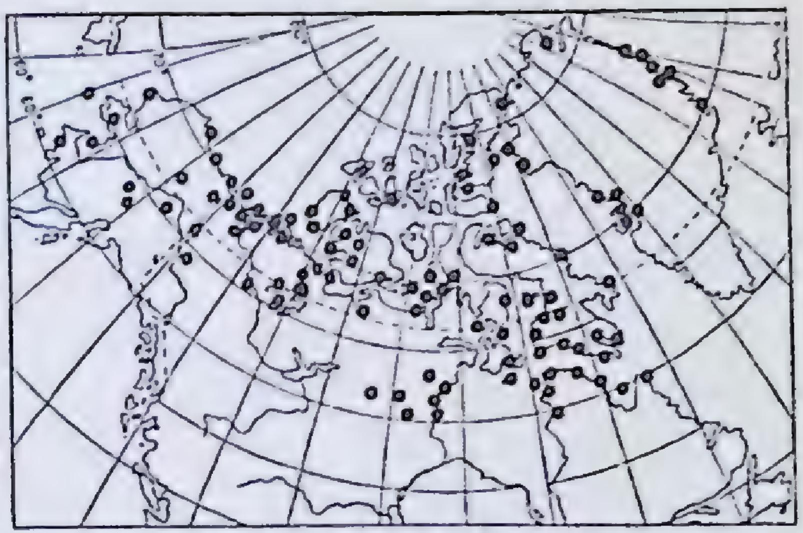


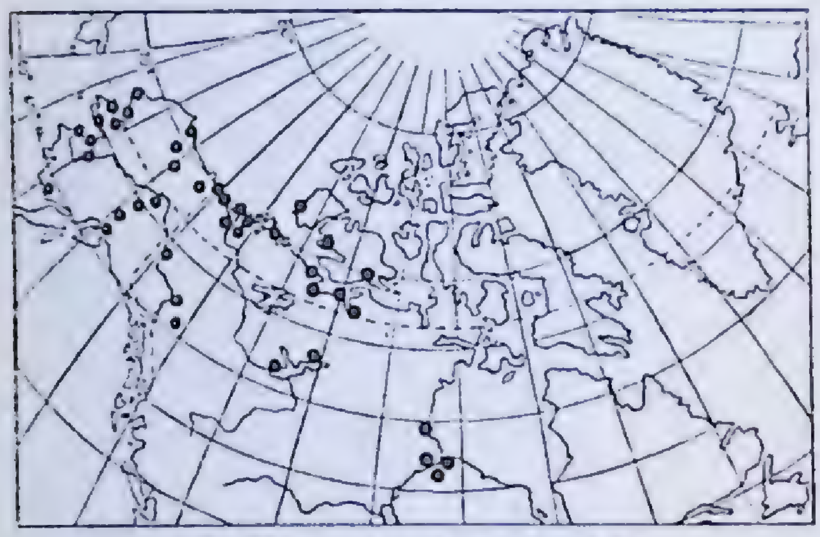
175. *Papaver radicatum* s. lat.

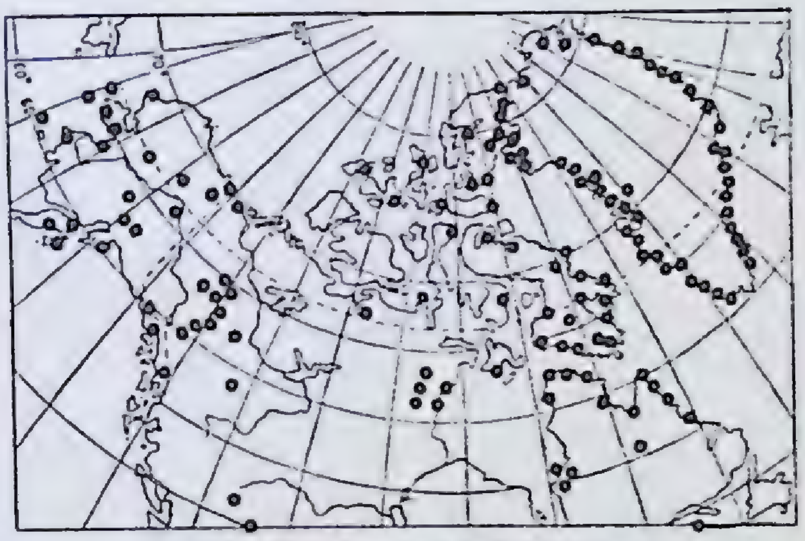


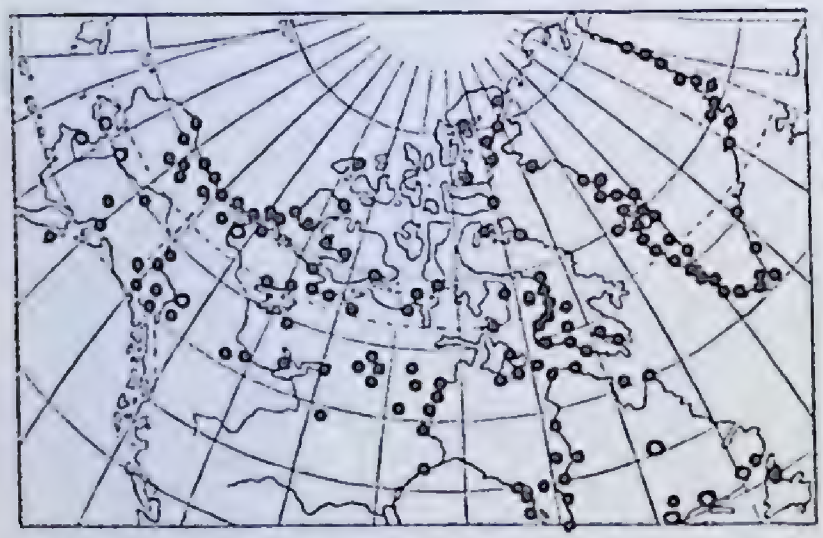
176. *Papaver Keelei*

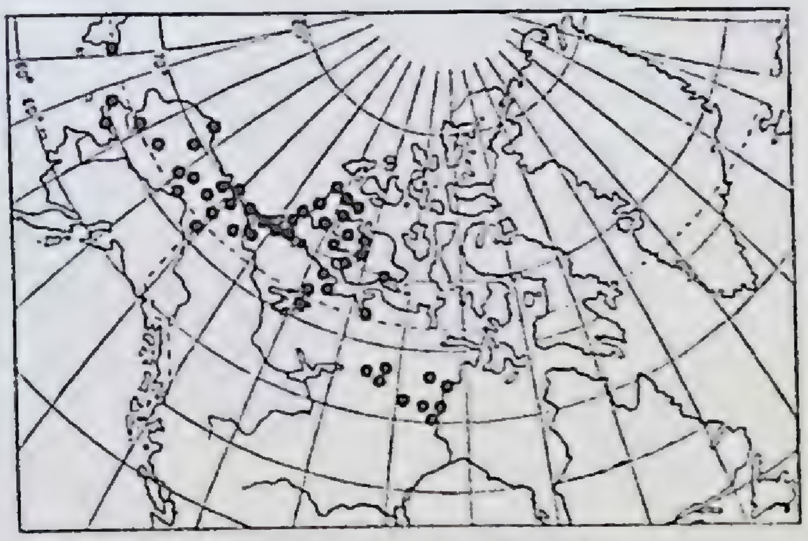

177. *Cochlearia officinalis* s. lat.

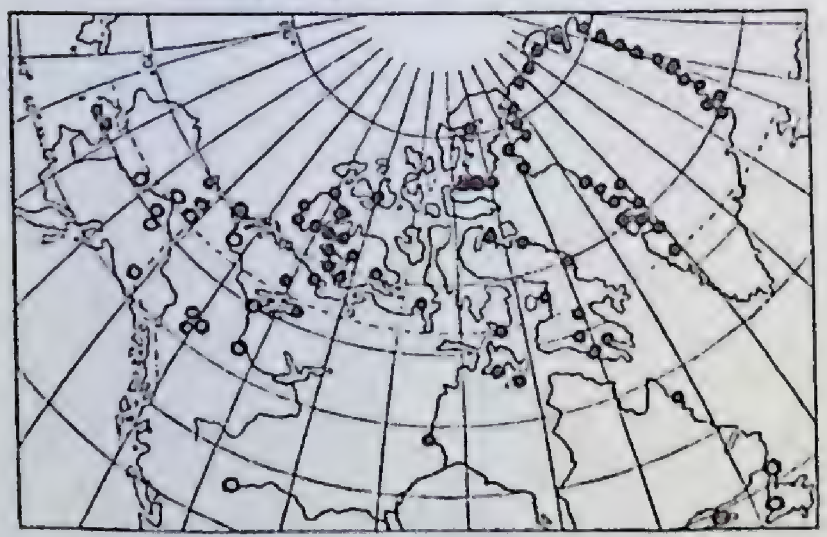

178. *Eutrema Edwardsii*

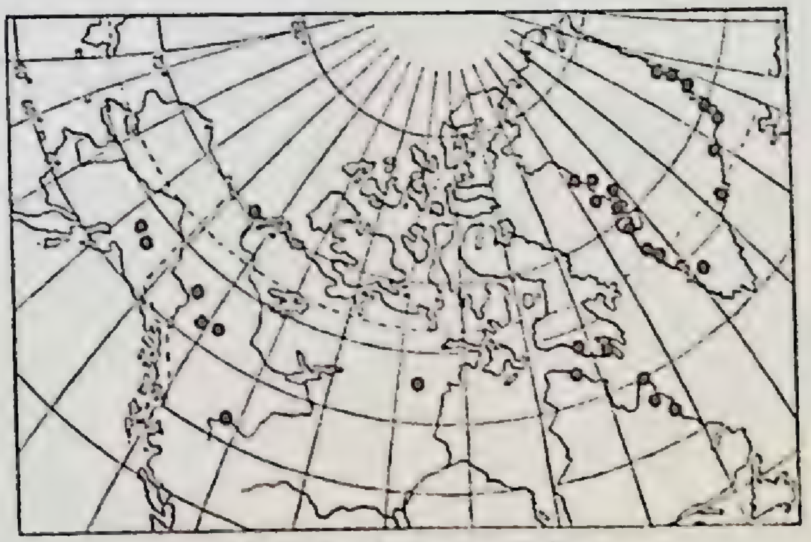

179. *Descurainia sophioides*

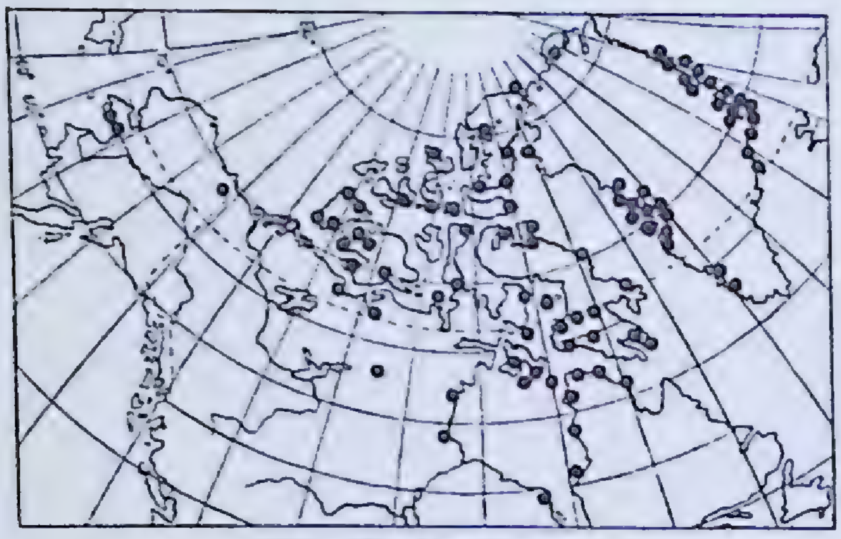

180. *Cardamine bellidifolia*


181. *Cardamine pratensis* s.str. (open circles)
var. *angustifolia* (solid circles)

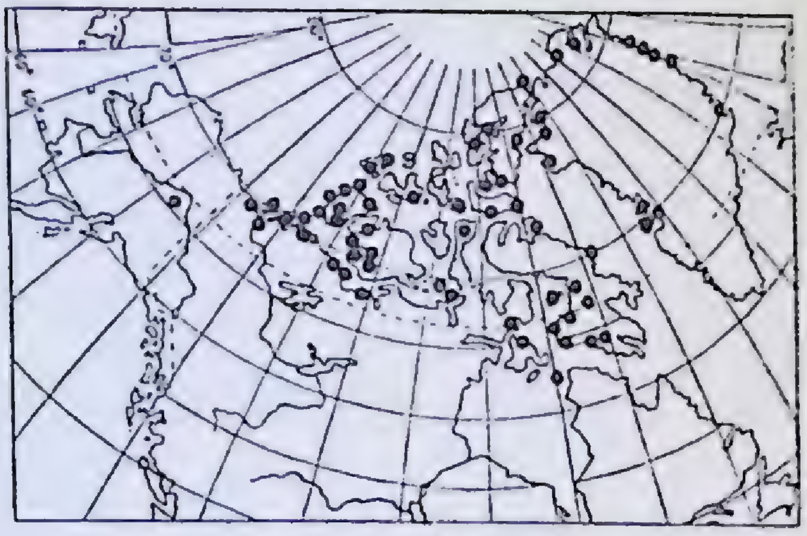

182. *Cardamine digitata*


183. *Lesquerella arctica* var. *typica*
(solid circles)
ssp. *Purshii* (open circles)

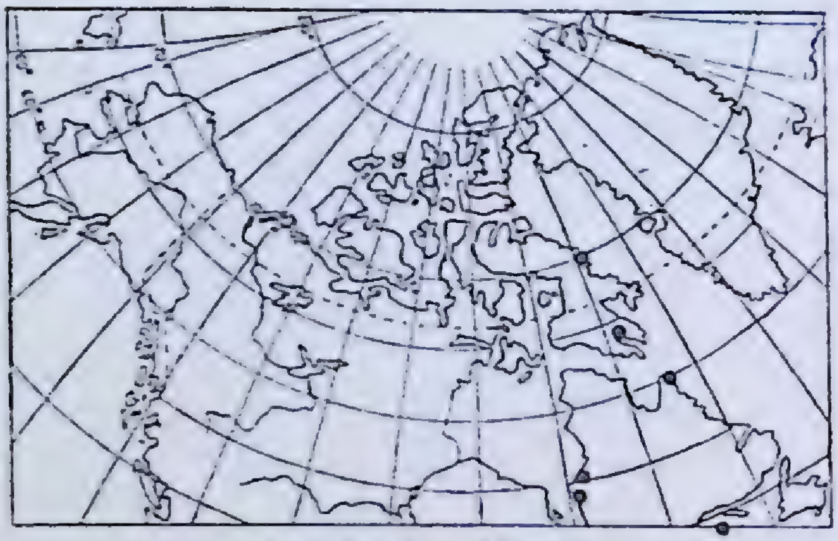

184. *Draba crassifolia*



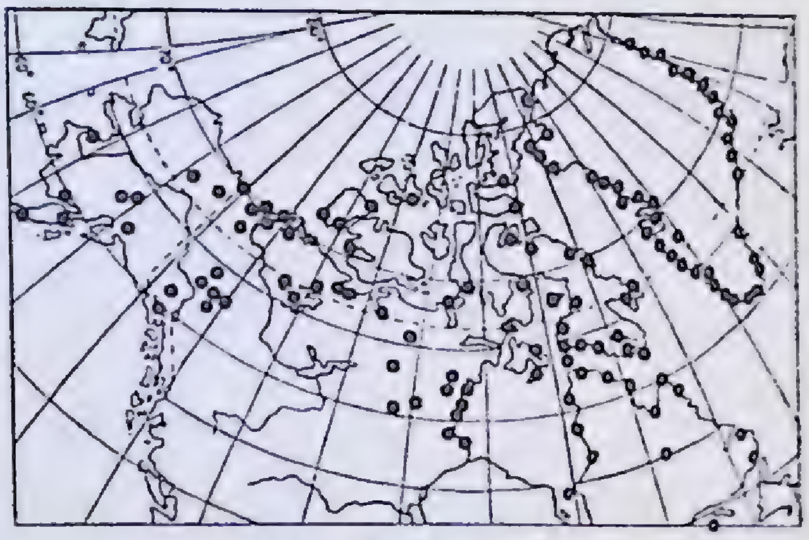
185. *Draba alpina*



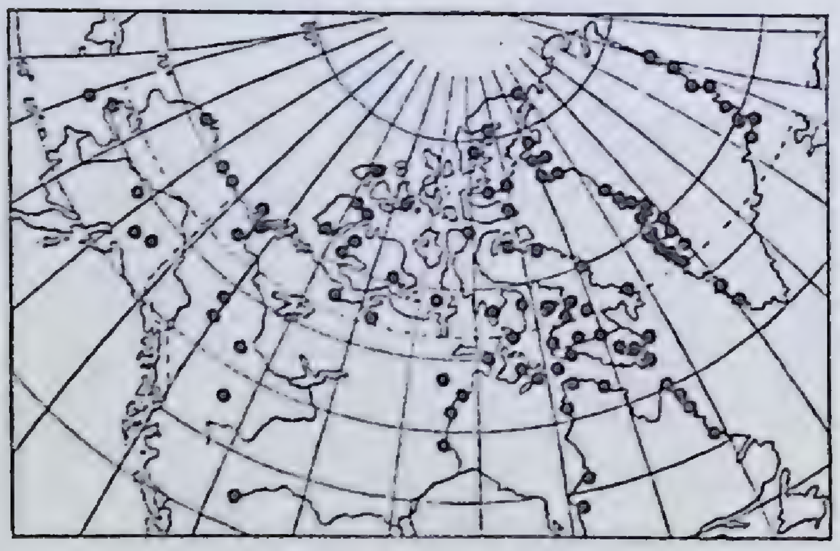
186. *Draba Bellii*



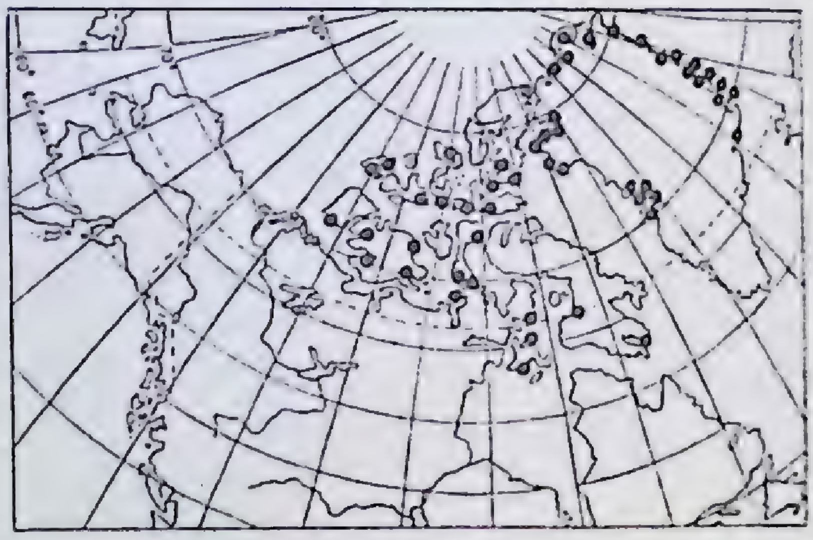
187. *Draba Allenii*



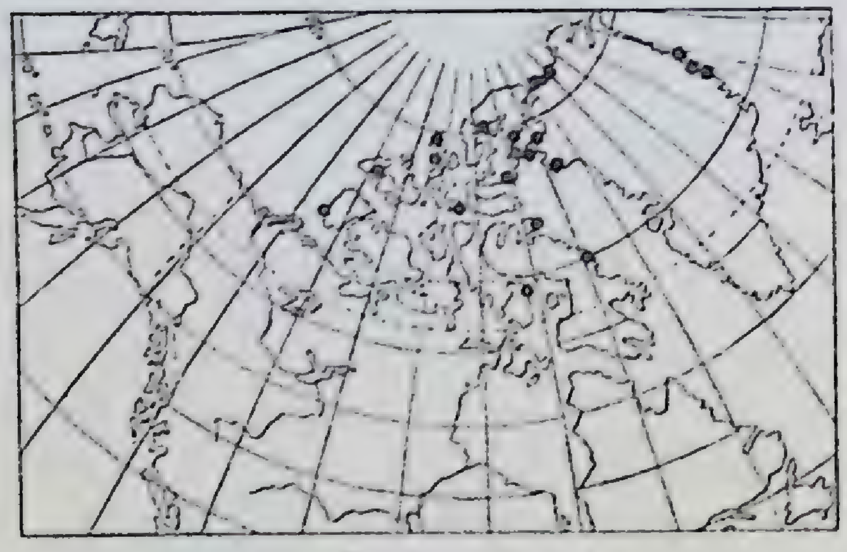
188. *Draba nivalis*



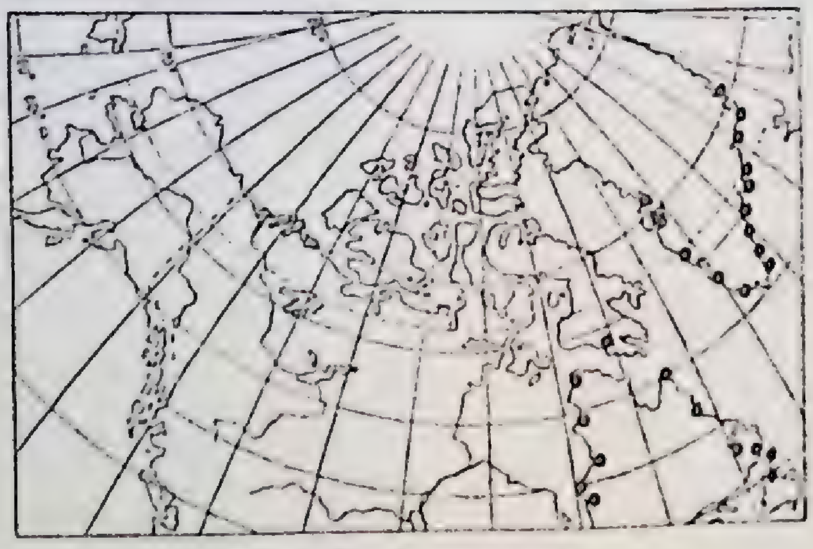
189. *Draba lactea*



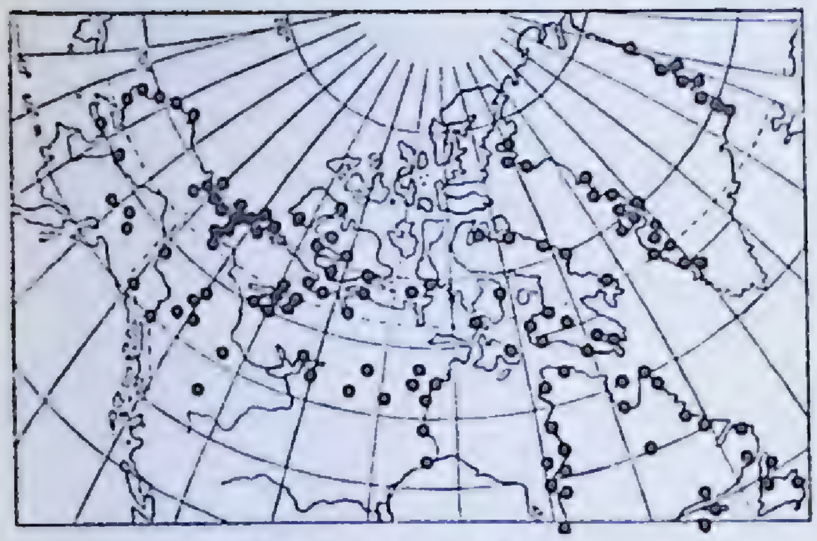
190. *Draba subcapitata*

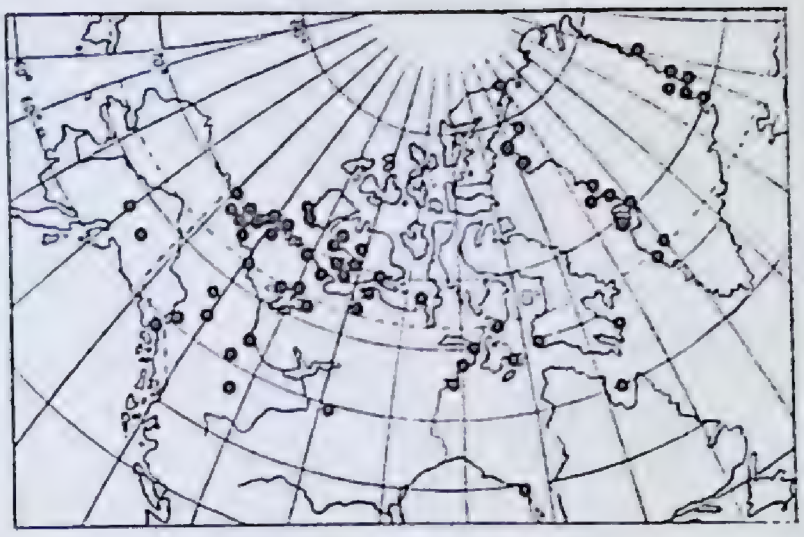


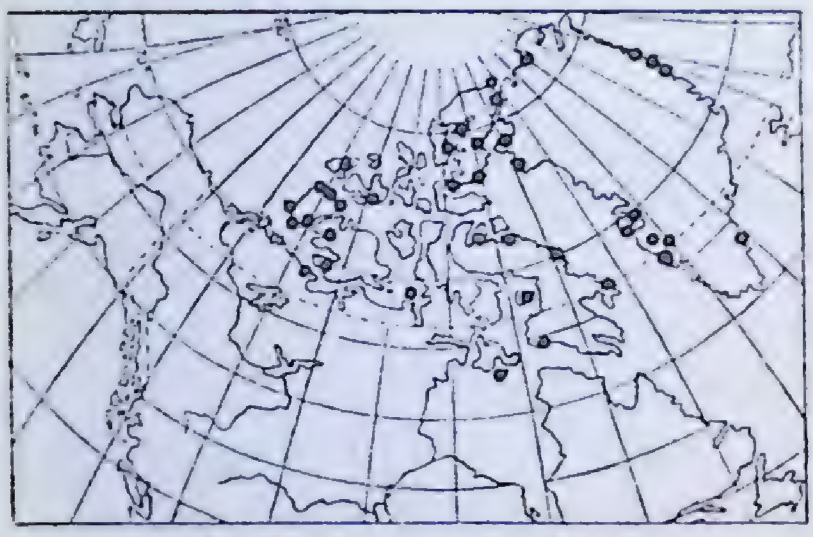
191. *Draba oblongata*

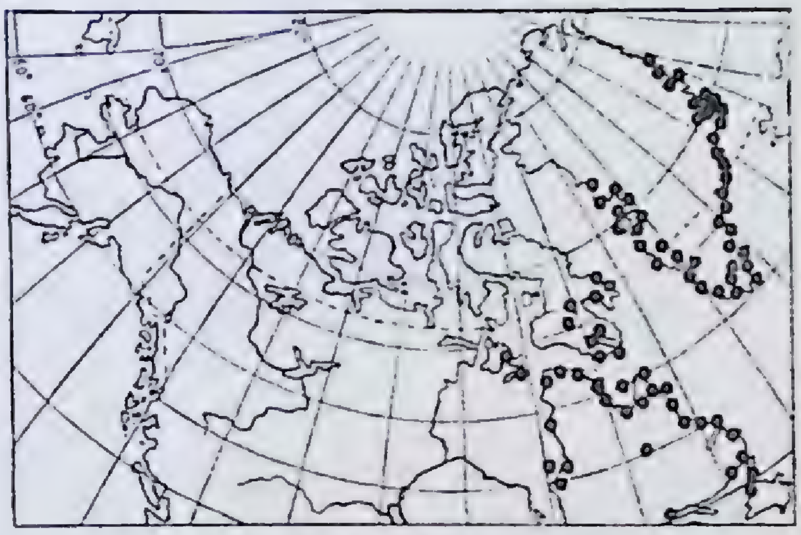


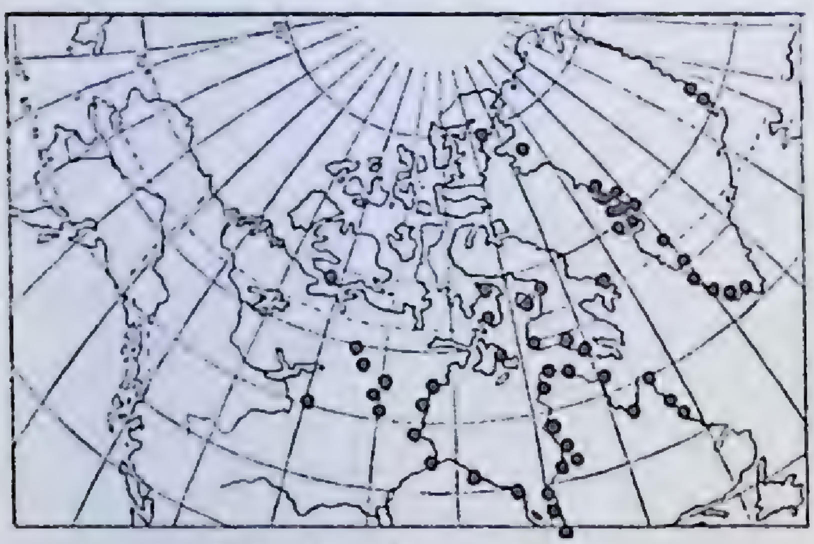
192. *Draba norvegica*

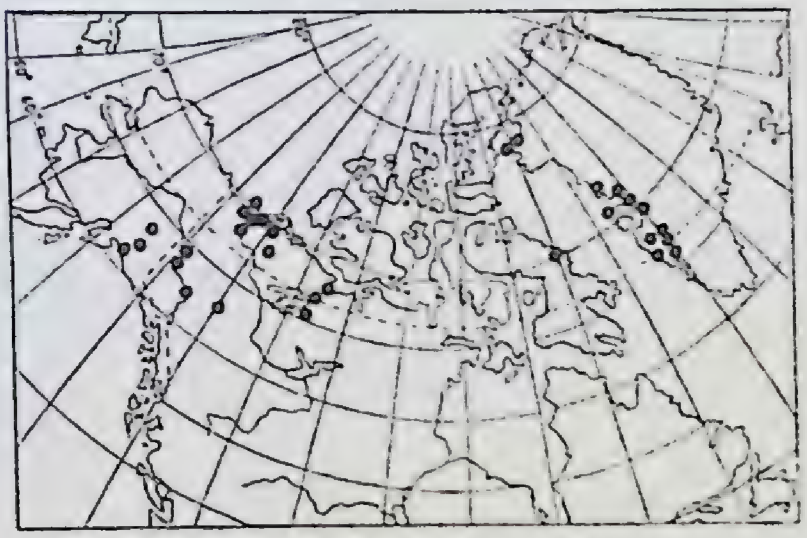

193. *Draba glabella*

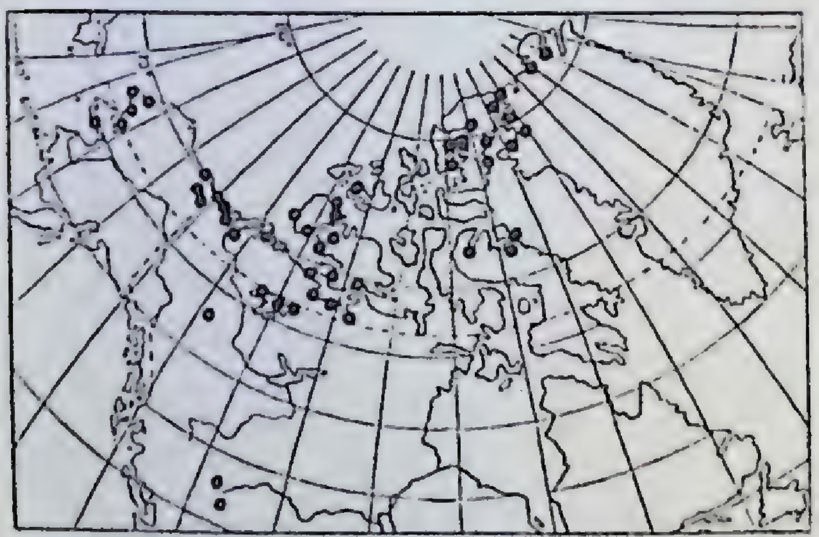

194. *Draba cinerea*

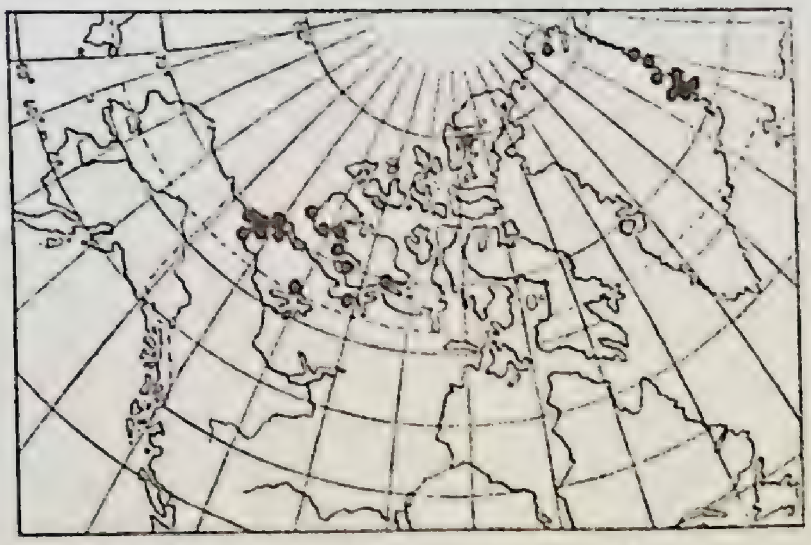

195. *Draba groenlandica*

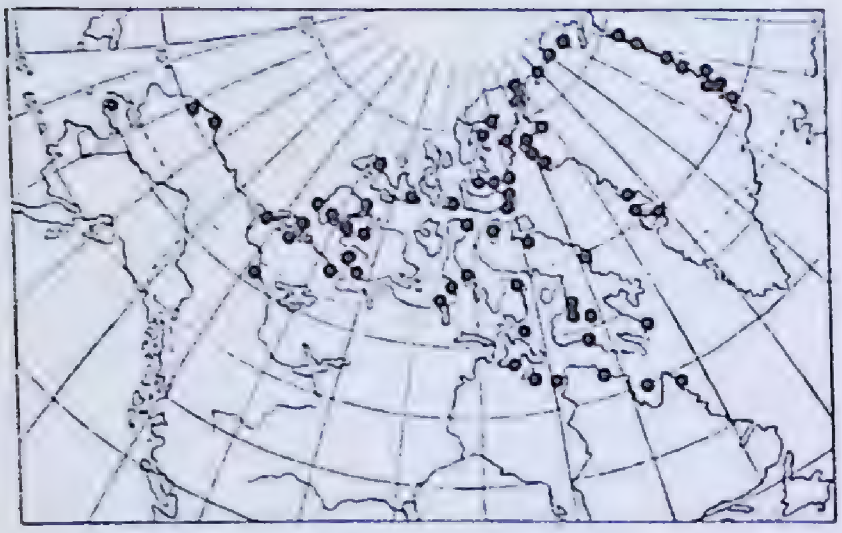

196. *Arabis alpina*


197. *Arabis arenicola*

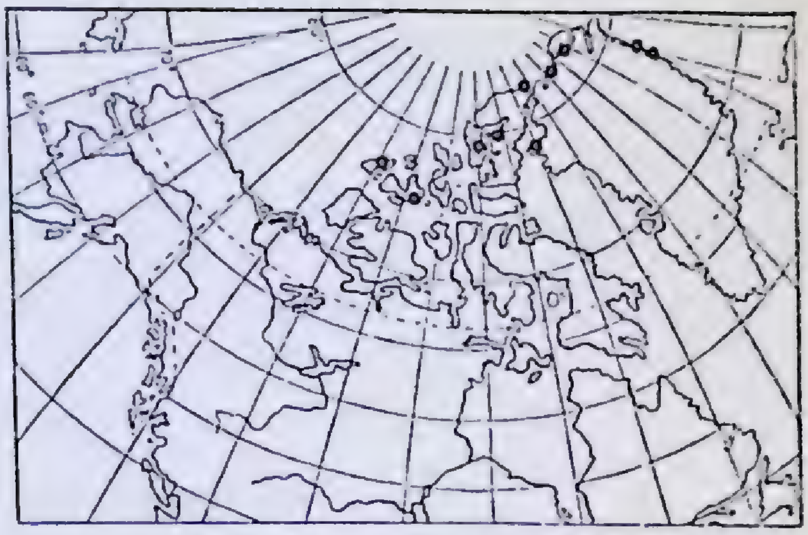

198. *Halimolobos mollis*


199. *Erysimum Pallasii*

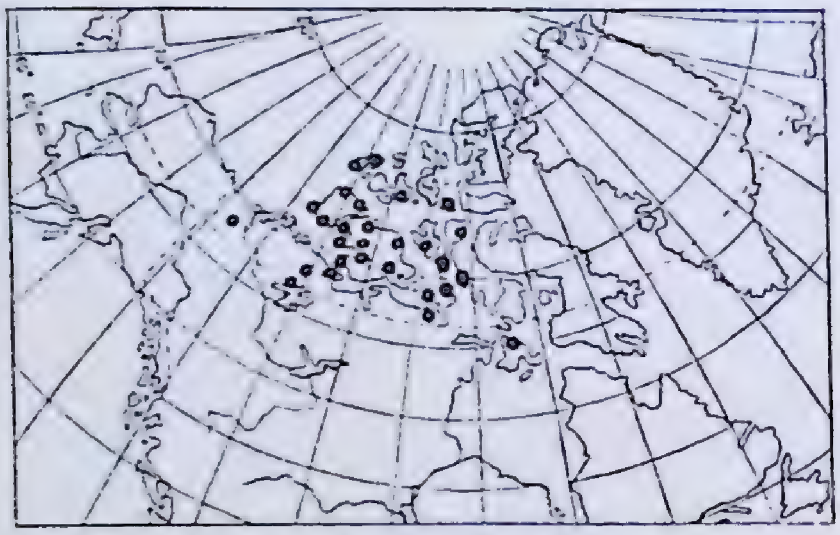

200. *Braya humilis* ssp. *arctica*



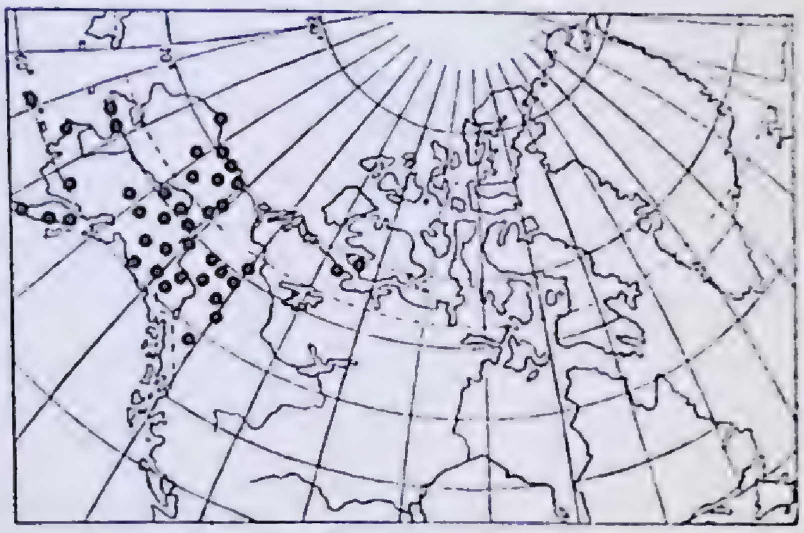
201. *Braya purpurascens*



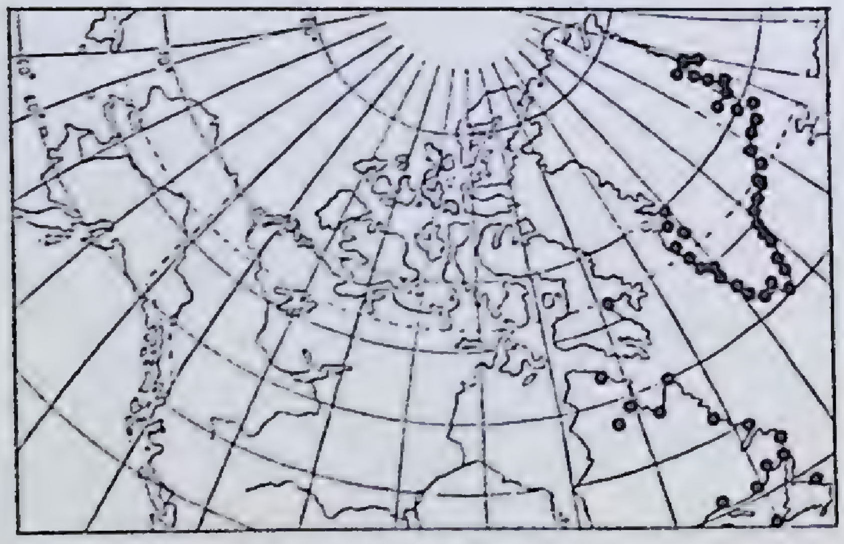
202. *Braya Thorild-Wulffii*



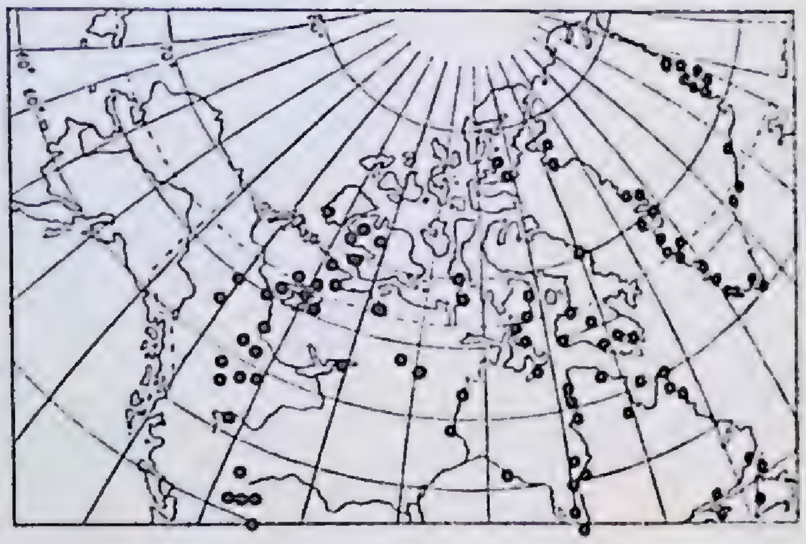
203. *Parrya arctica*



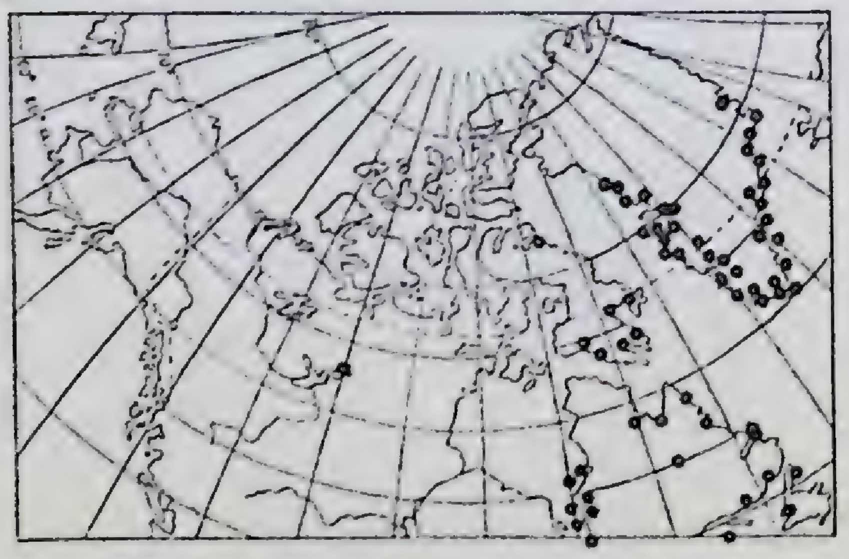
204. *Parrya nudicaulis*



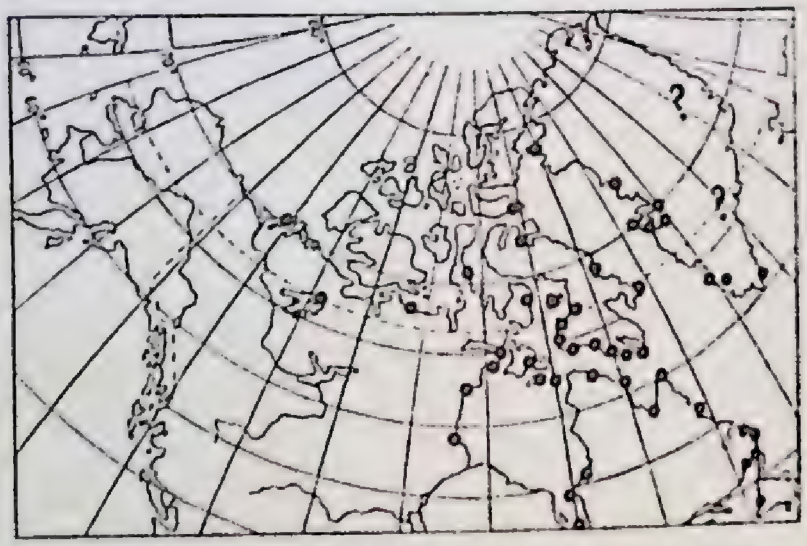
205. *Rhodiola Rosea*



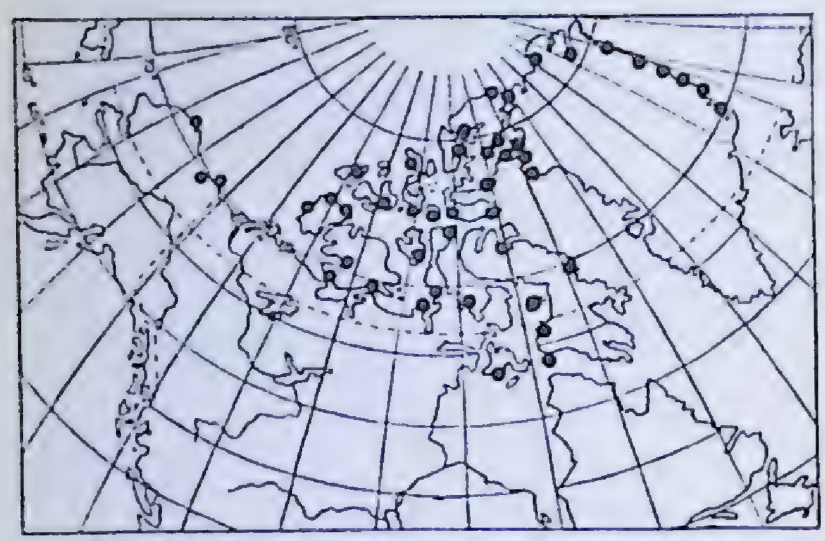
206. *Saxifraga aizoides*



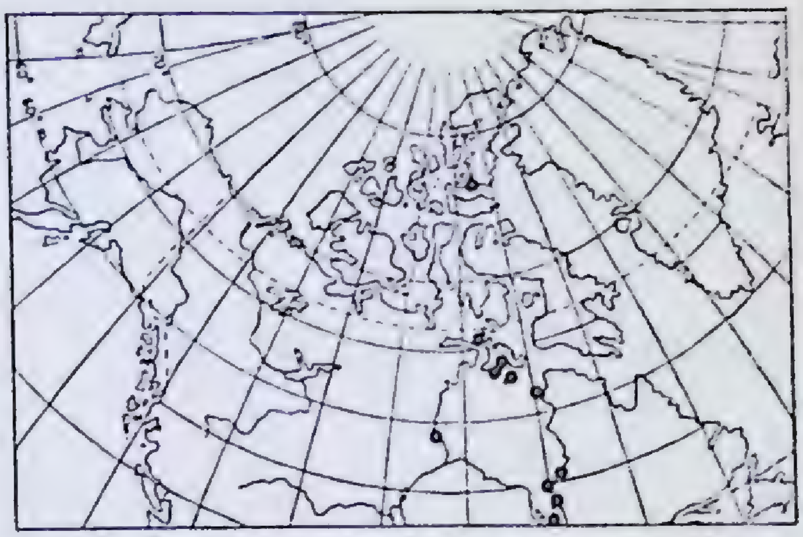
207. *Saxifraga Aizoon* var. *neogaea*



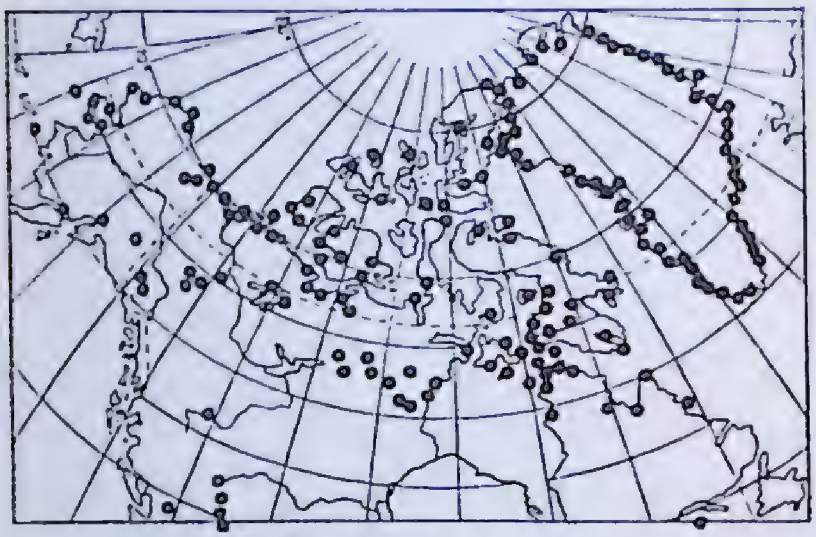
208. *Saxifraga caespitosa* ssp. *eucaespitosa*



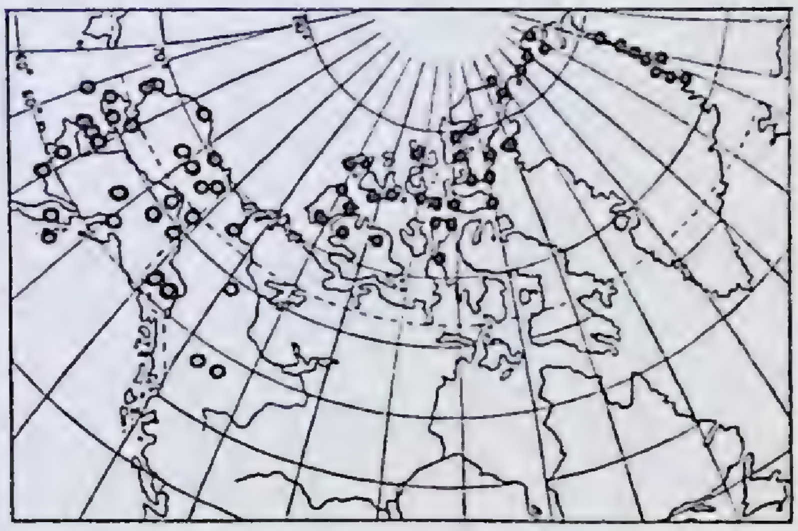
209. *Saxifraga caespitosa* ssp. *uniflora*



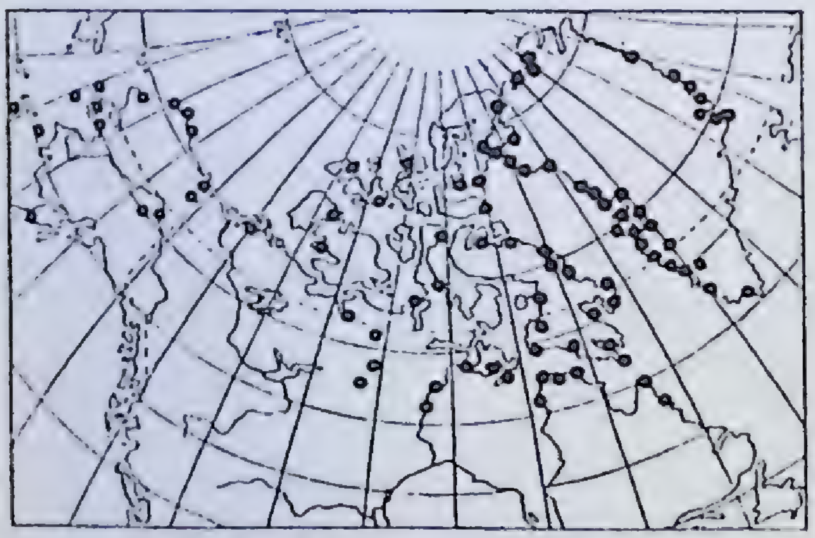
210. *Saxifraga caespitosa* ssp. *exaratoides*



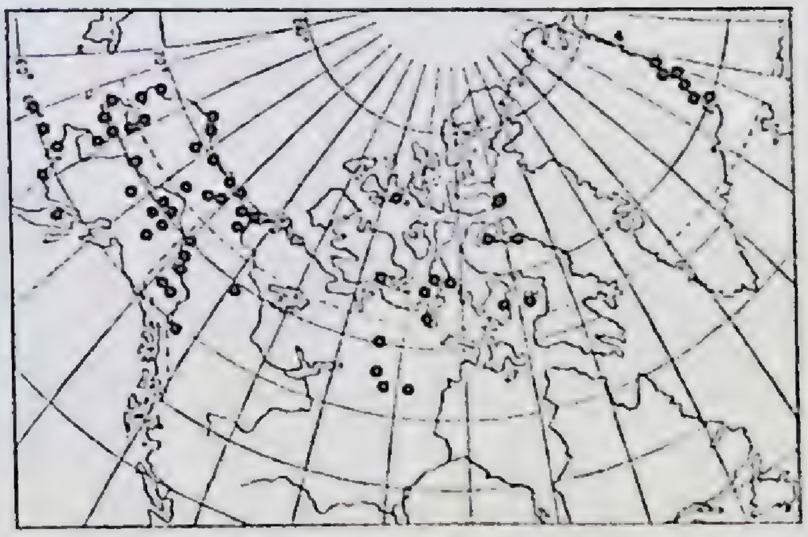
211. *Saxifraga cernua*



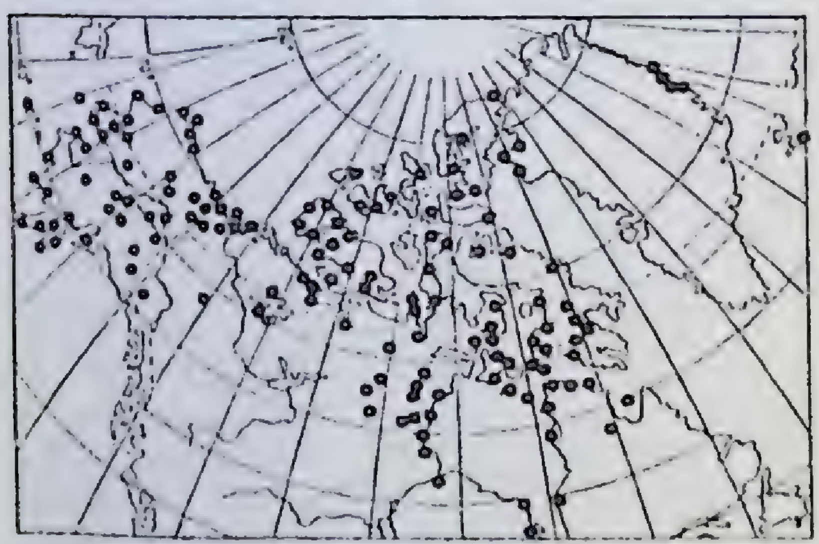
212. *Saxifraga flagellaris*
ssp. *platysepala* (solid circles)
ssp. *flagellaris* (open circles)



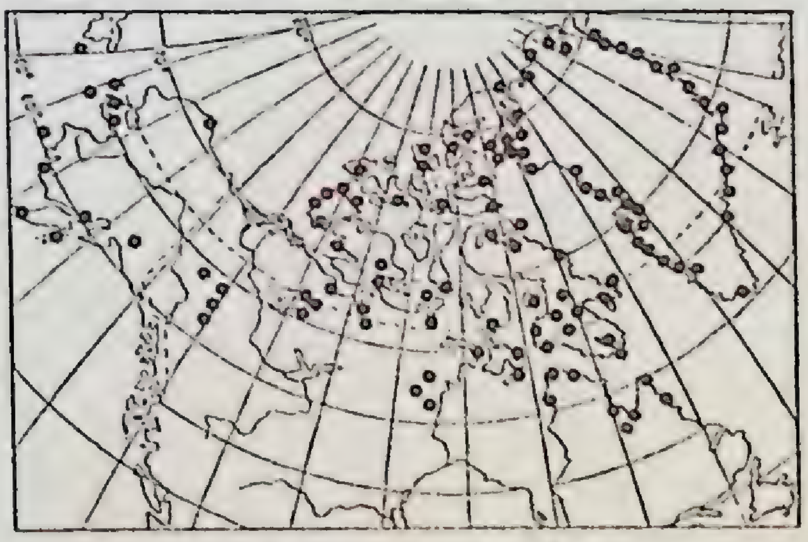
213. *Saxifraga foliolosa*



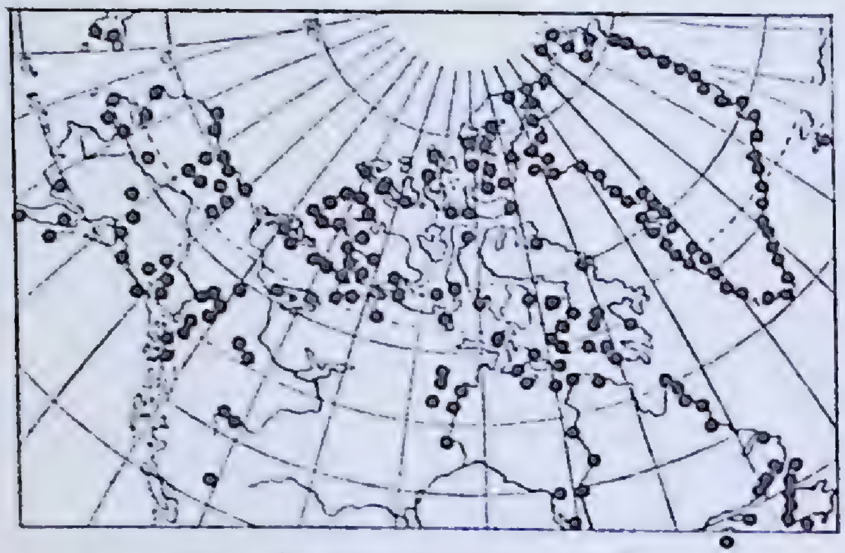
214. *Saxifraga hieracifolia*



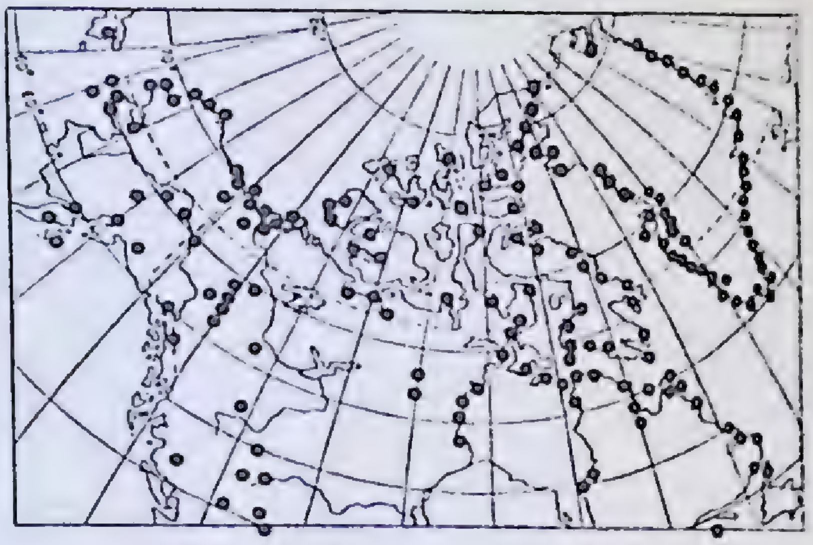
215. *Saxifraga Hirculus* s. lat.



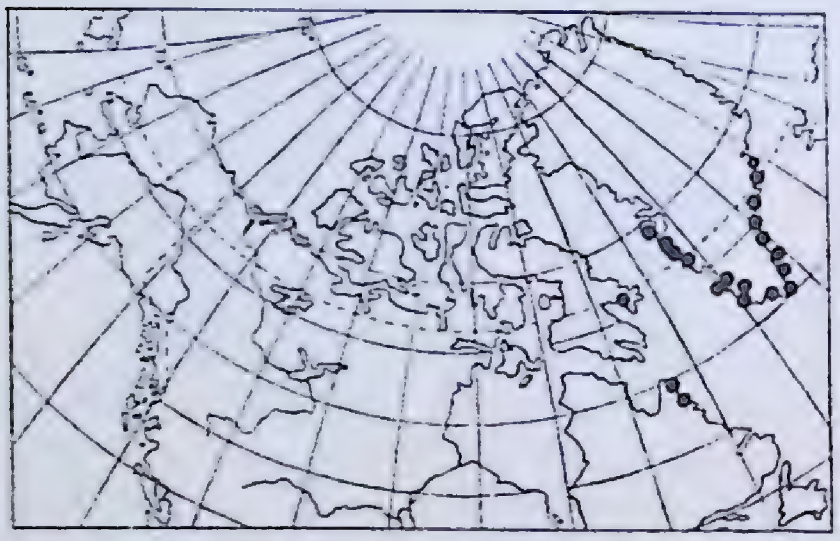
216. *Saxifraga nivalis*



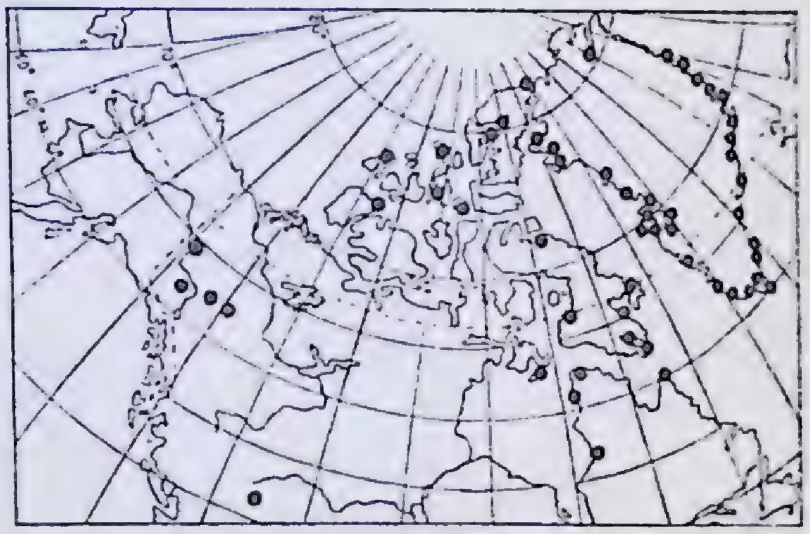
217. *Saxifraga oppositifolia*



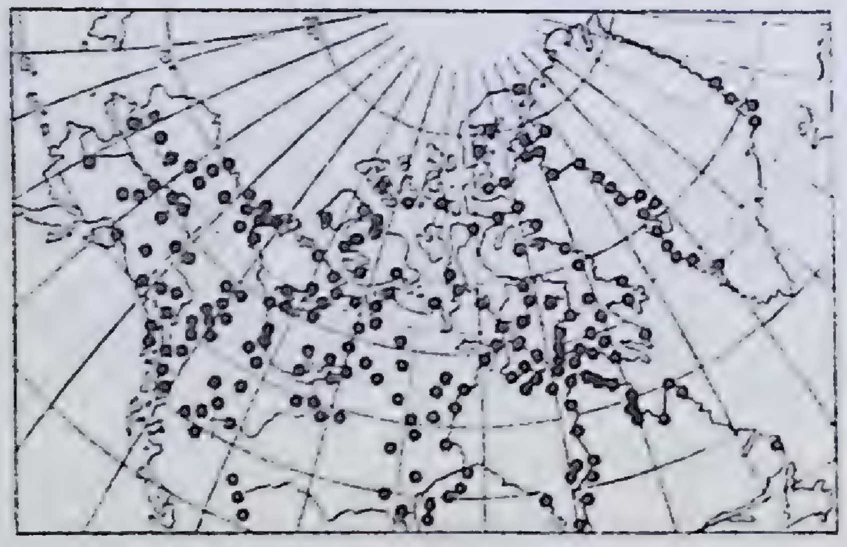
218. *Saxifraga rivularis* s. lat.



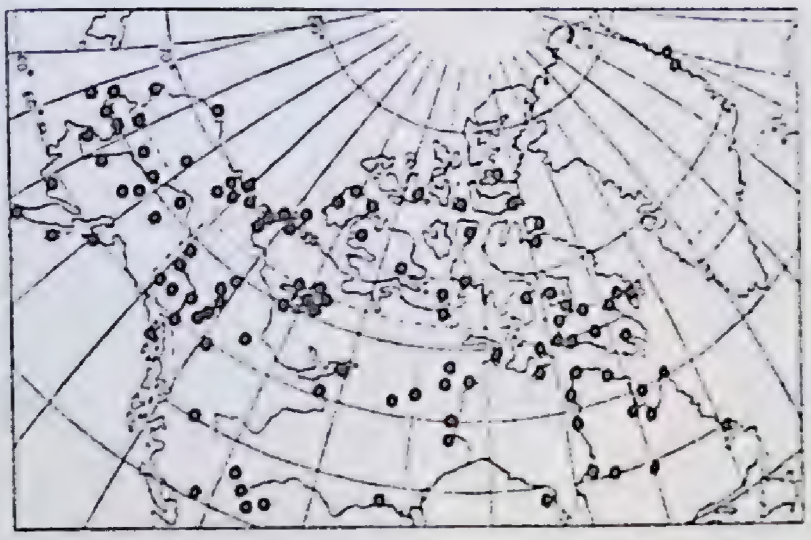
219. *Saxifraga stellaris*



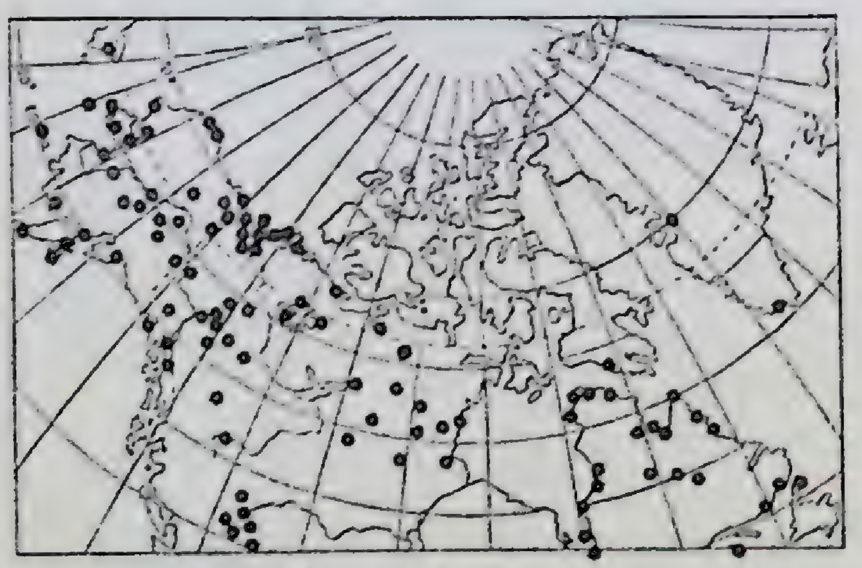
220. *Saxifraga tenuis*



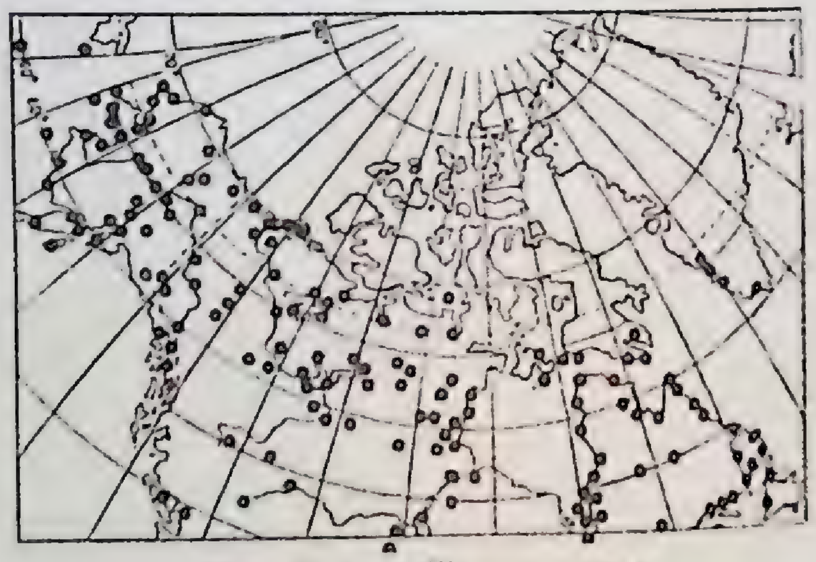
221. *Saxifraga tricuspidata*



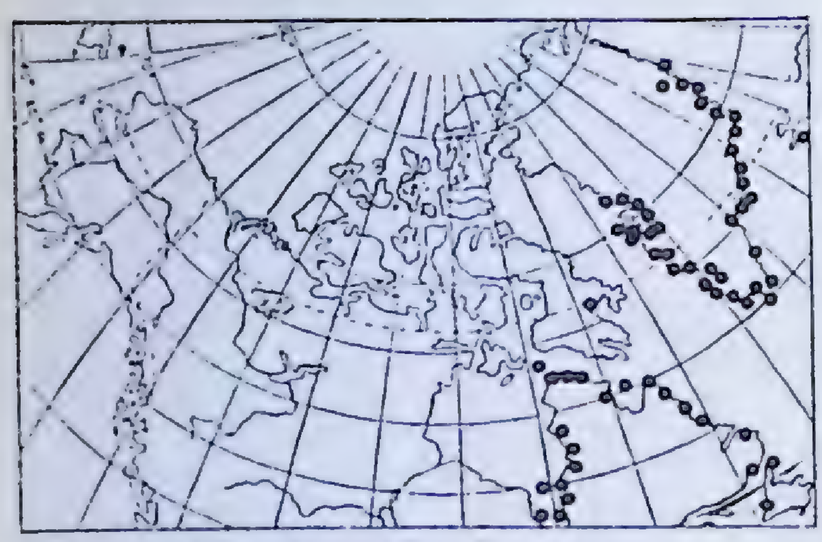
222. *Chrysosplenium tetrandrum*



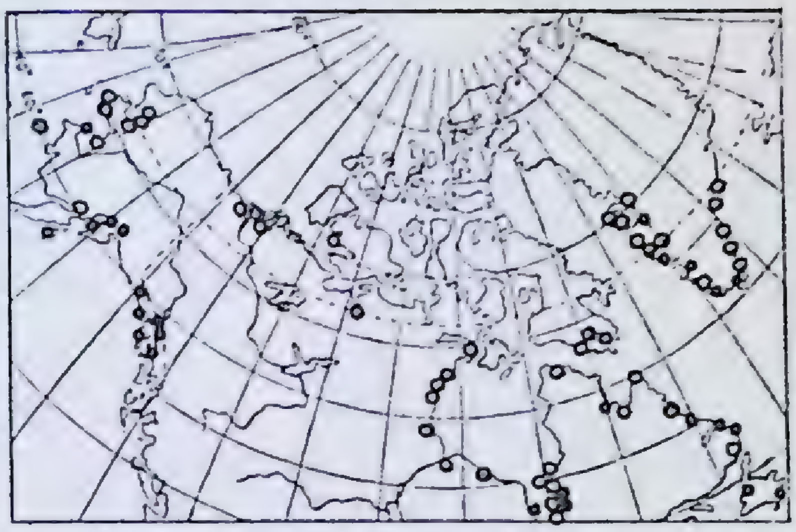
223. *Parnassia Kotzebuei*



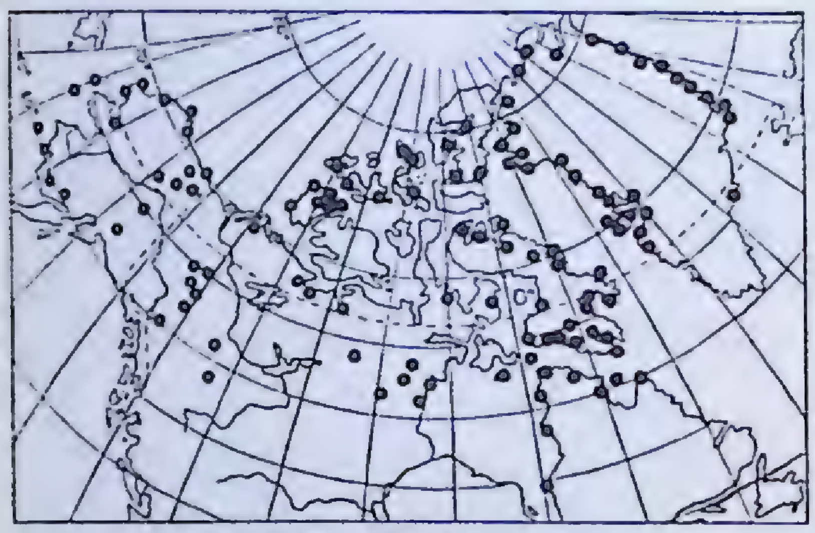
224. *Rubus Chamaemorus*



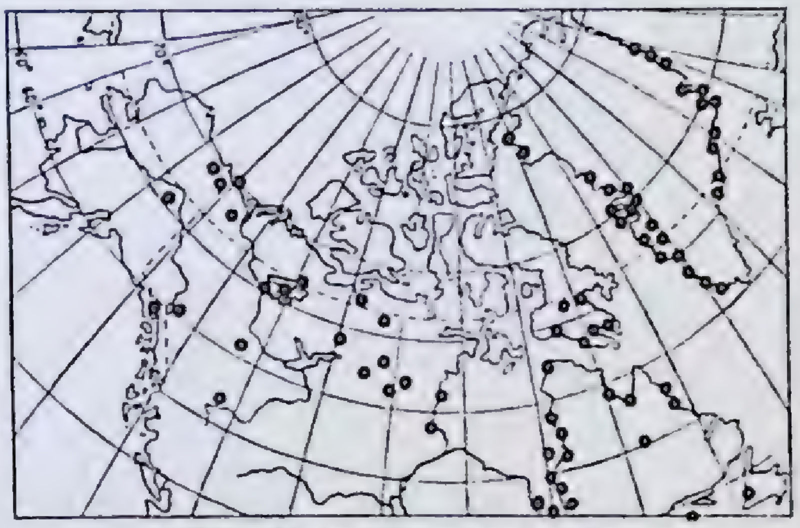
225. *Potentilla Crantzii*



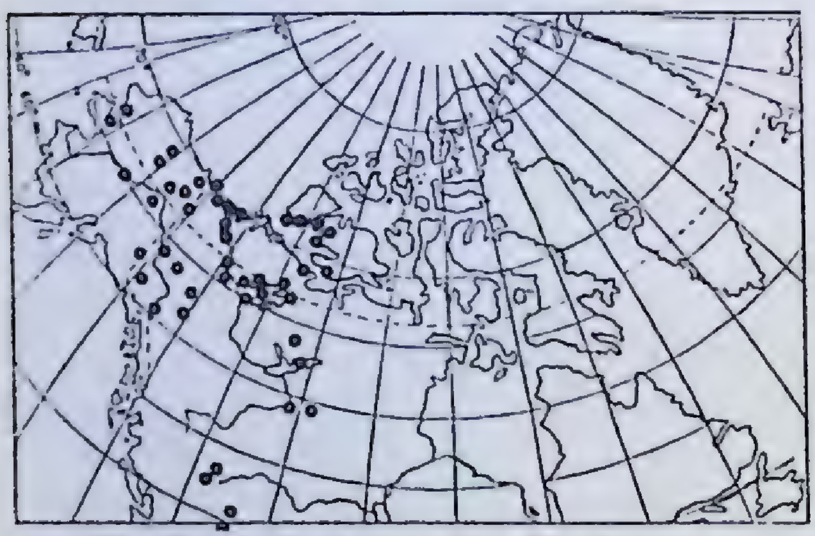
226. *Potentilla Egedii* (solid circles)
var. *groenlandica* (open circles)



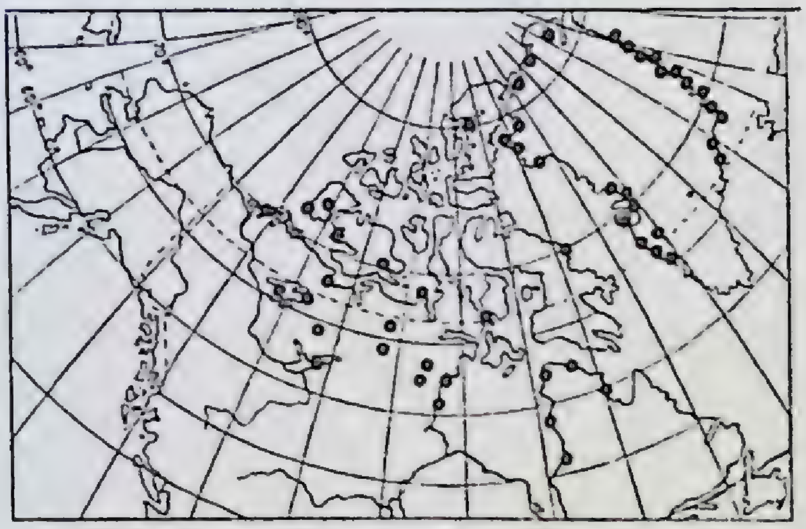
227. *Potentilla hyparctica*
(including var. *elatior*)



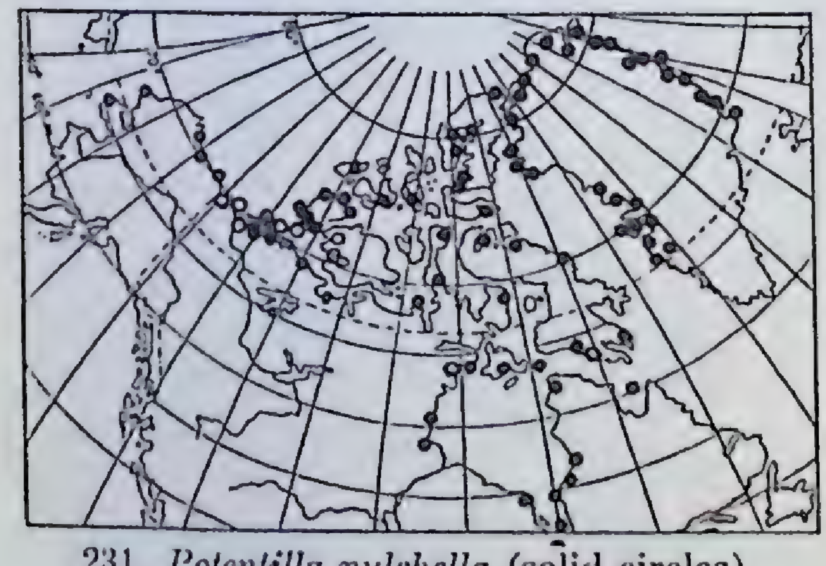
228. *Potentilla nivea* s. str.



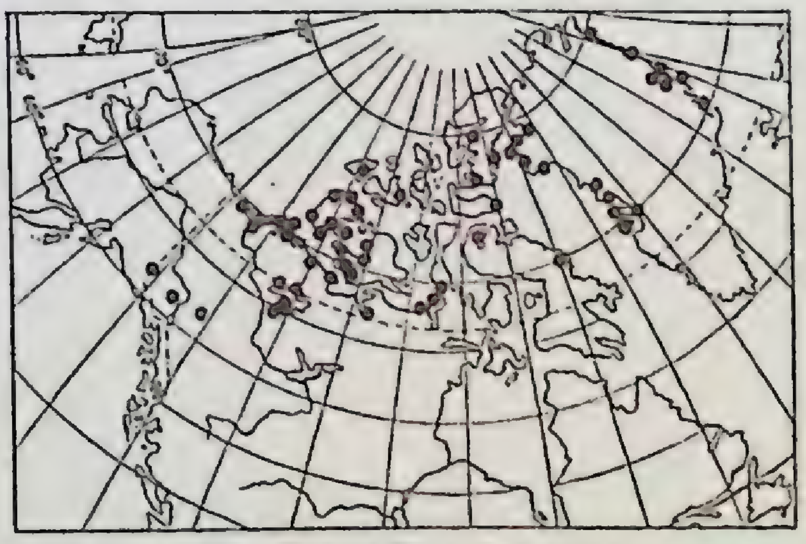
229. *Potentilla nivea* ssp. *Hookeriana*



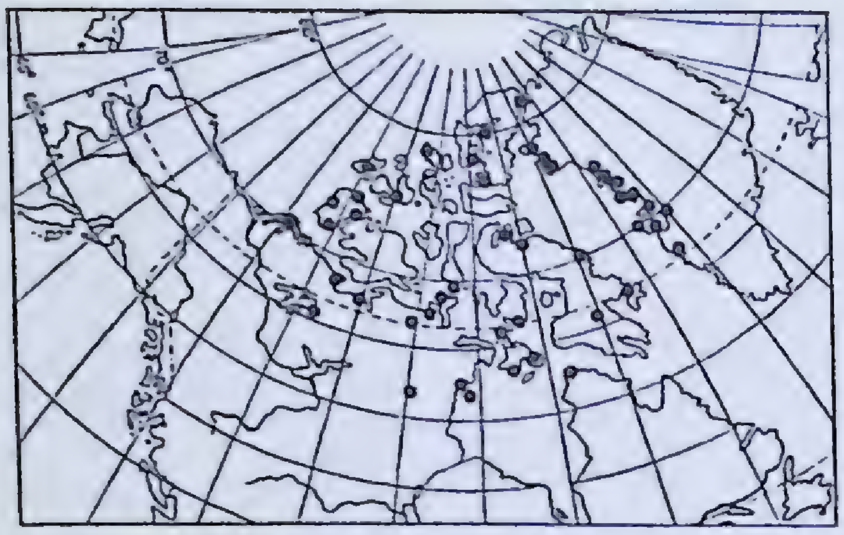
230. *Potentilla nivea* ssp. *Chamissonis*



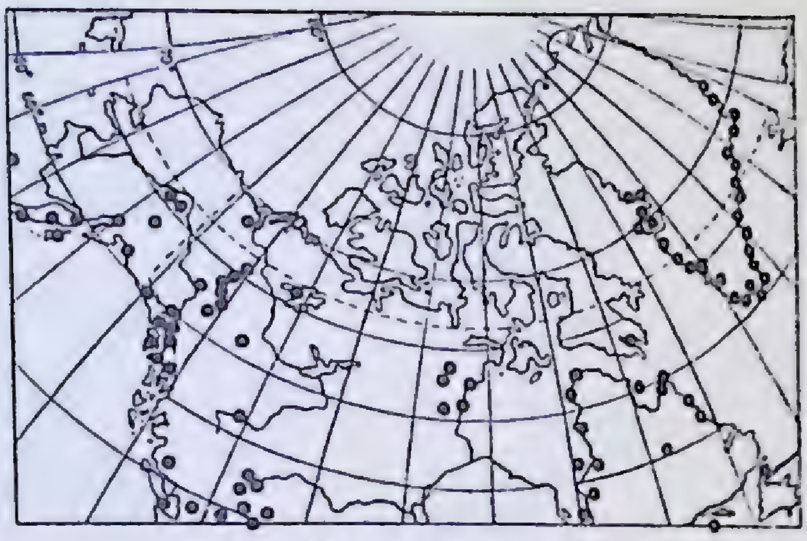
231. *Potentilla pulchella* (solid circles)
var. *gracilicaulis* (open circles)



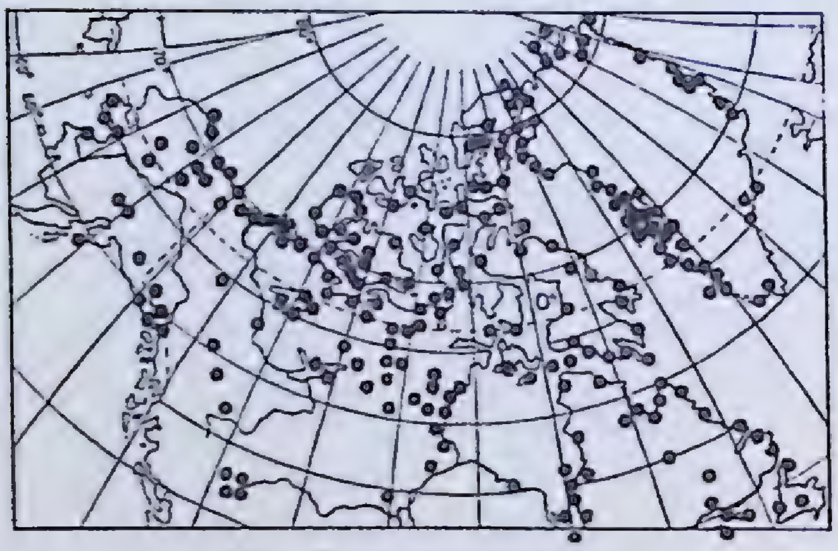
232. *Potentilla rubricaulis*



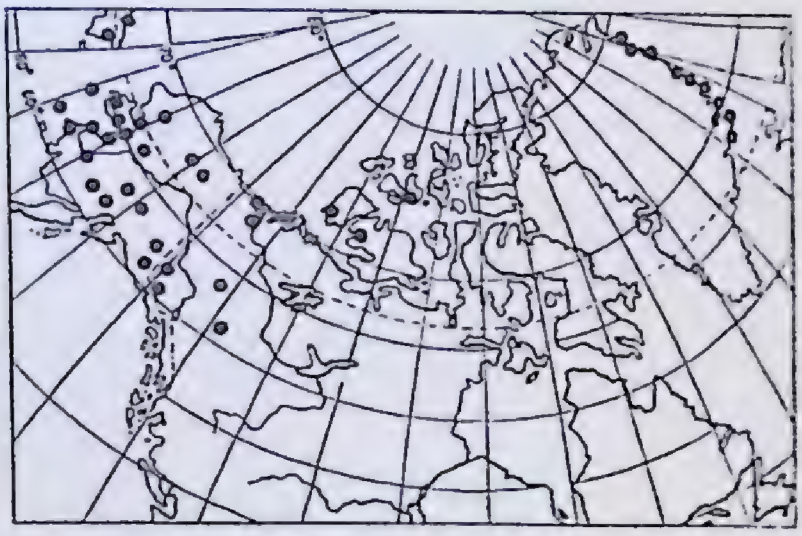
233. *Potentilla Vahliana*



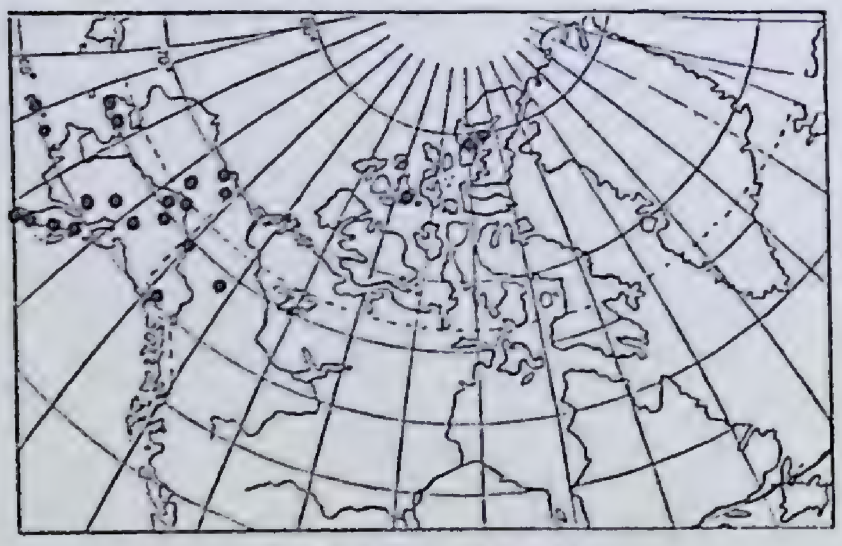
234. *Sibbaldia procumbens*



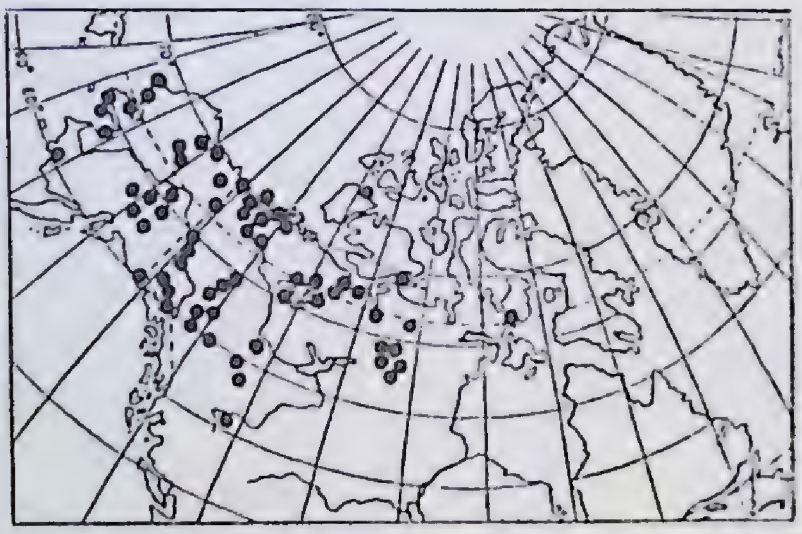
235. *Dryas integrifolia*



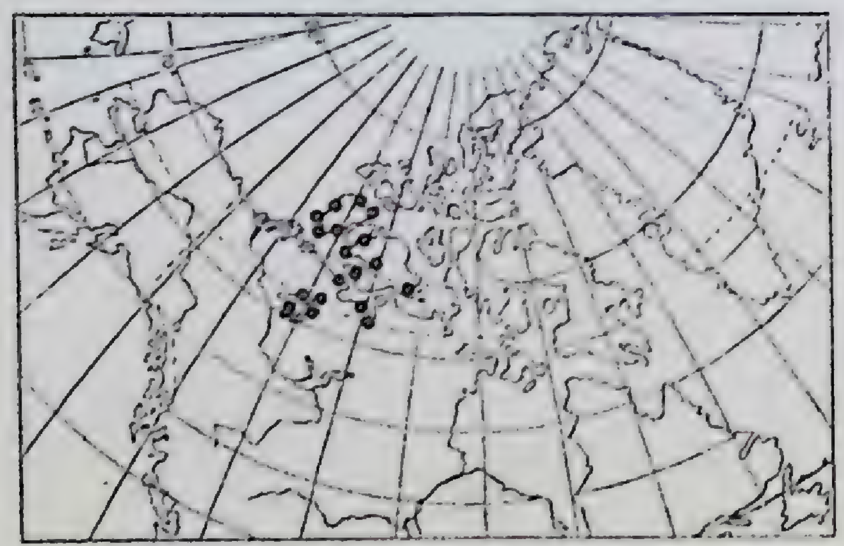
236. *Dryas punctata*



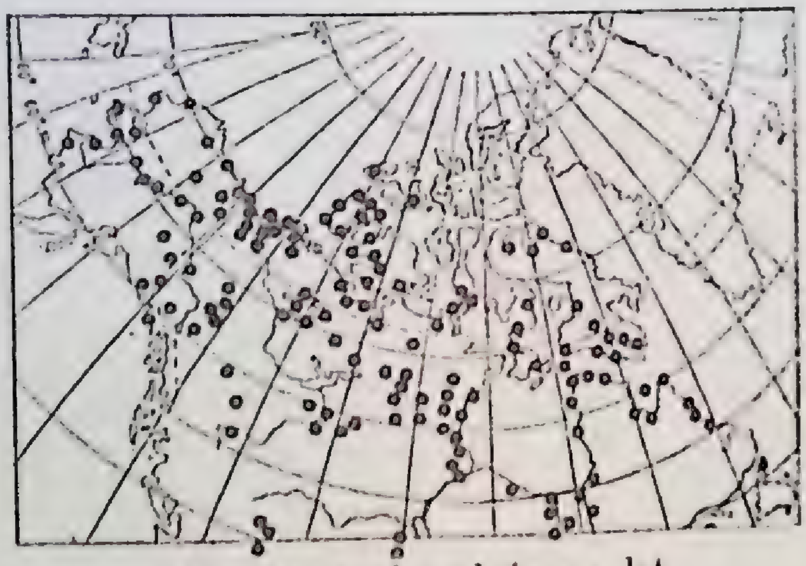
237. *Geum Rossii*



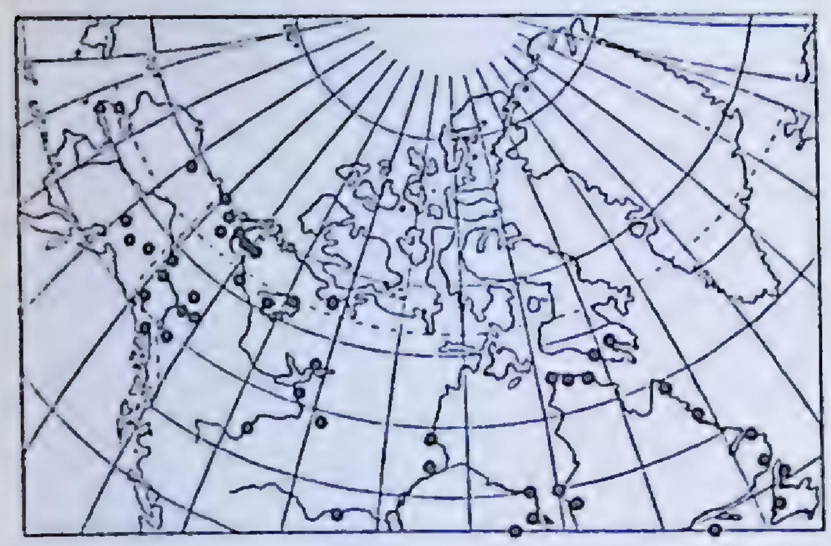
238. *Lupinus arcticus*



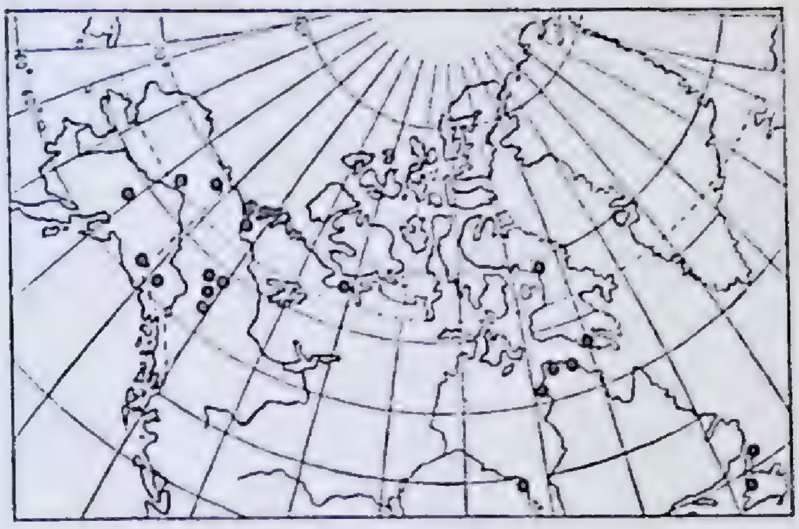
239. *Astragalus Richardsonii*



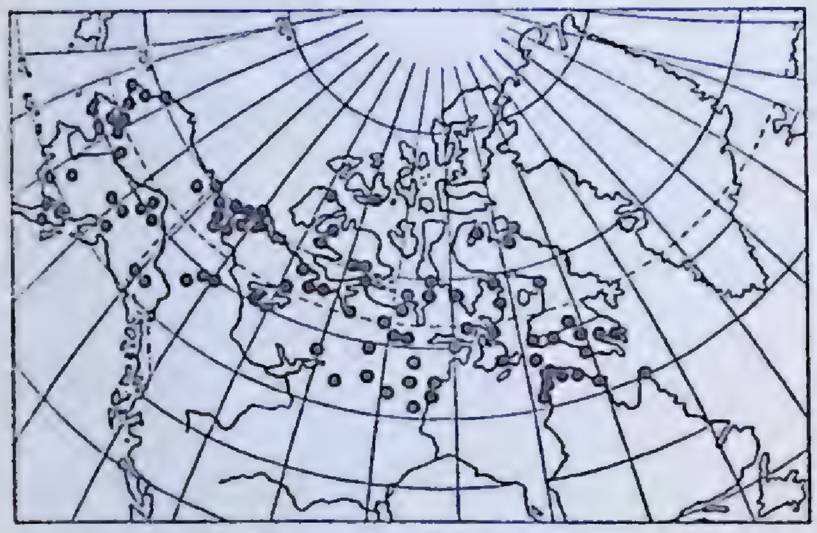
240. *Astragalus alpinus* s. lat.



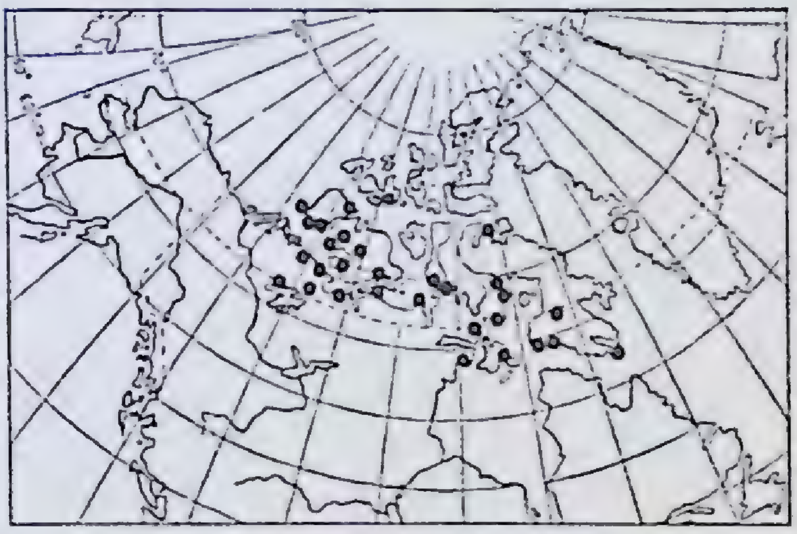
241. *Astragalus eucosmus*



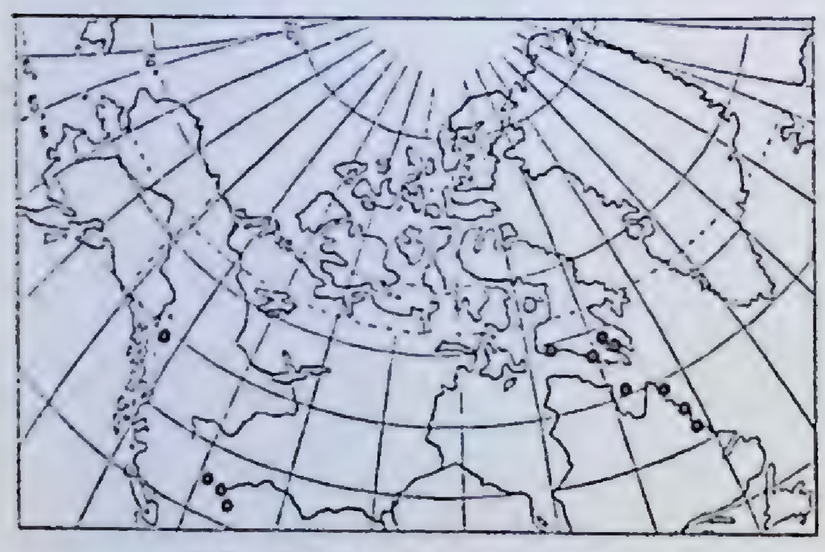
242. *Oxytropis foliolosa*



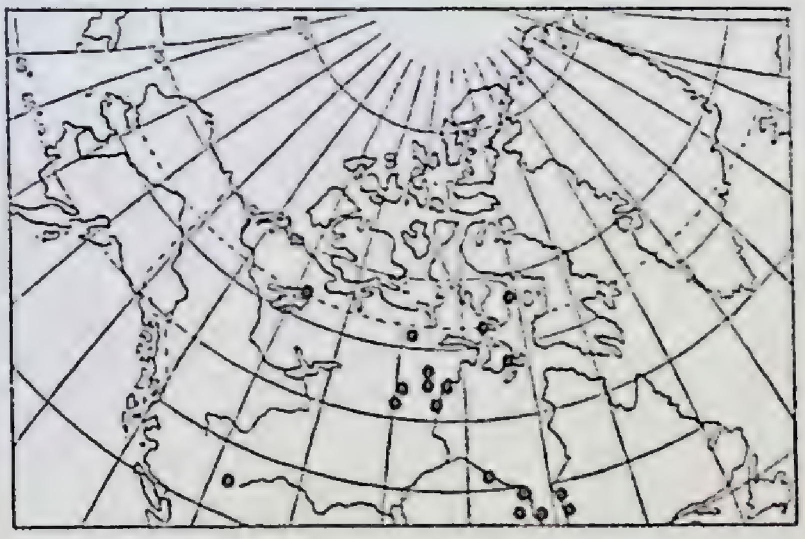
243. *Oxytropis Maydelliana*



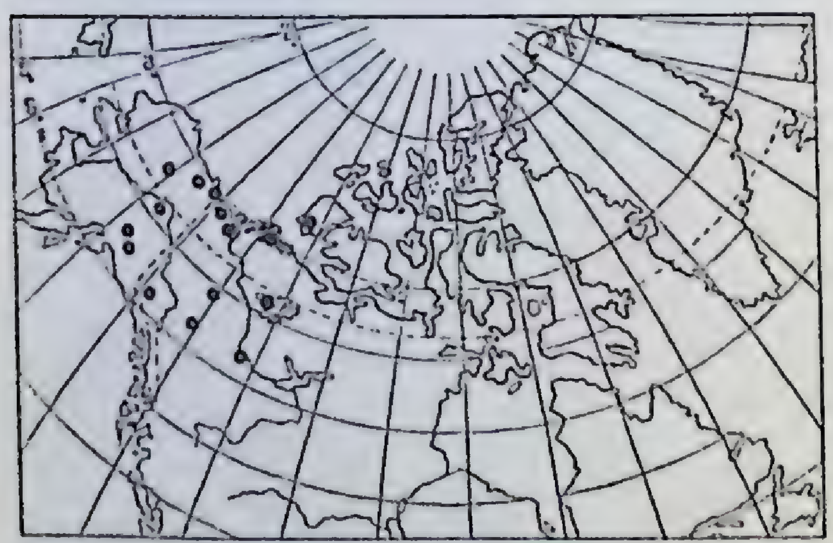
244. *Oxytropis arctobia*



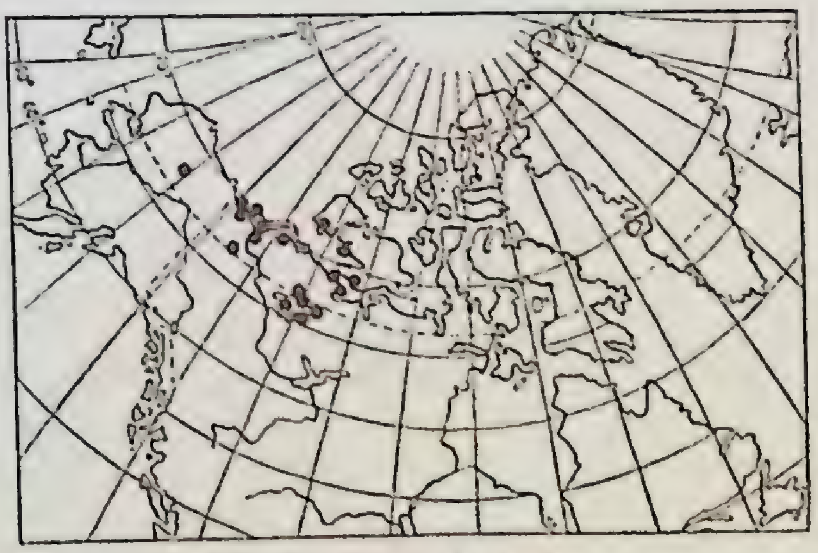
245. *Oxytropis podocarpa*



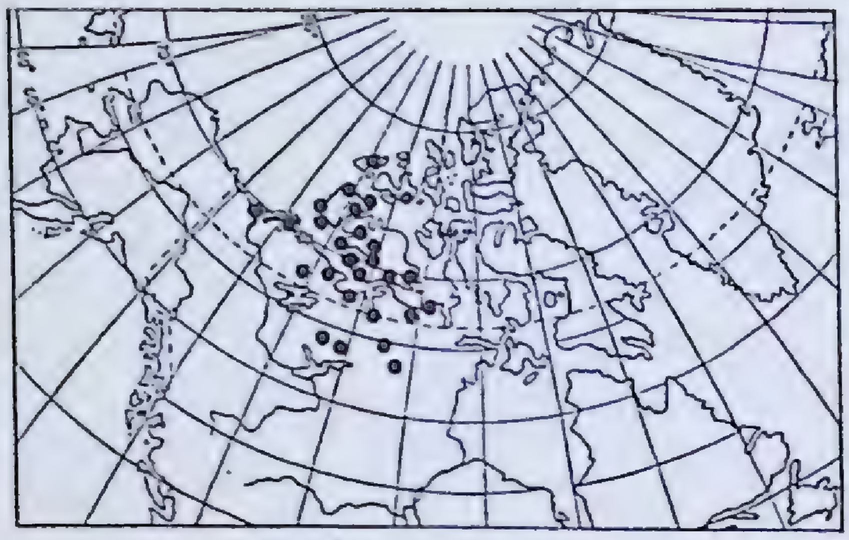
246. *Oxytropis hudsonica*



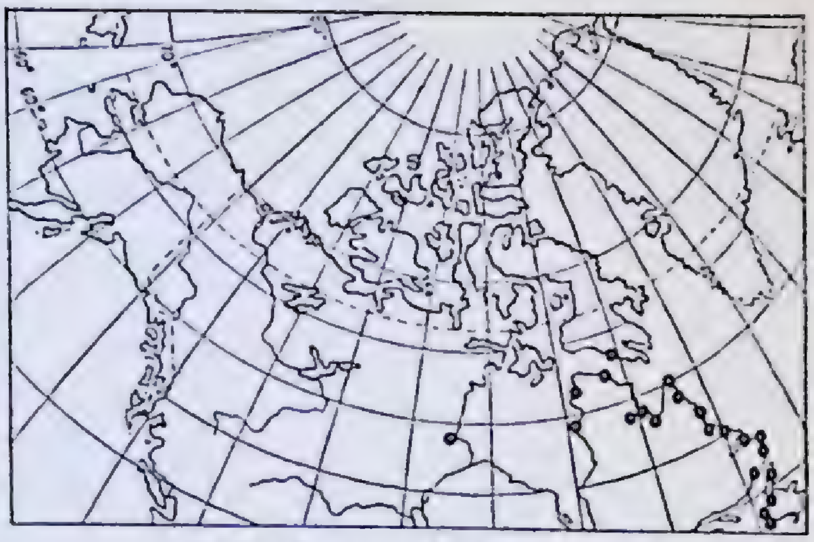
247. *Oxytropis glutinosa*



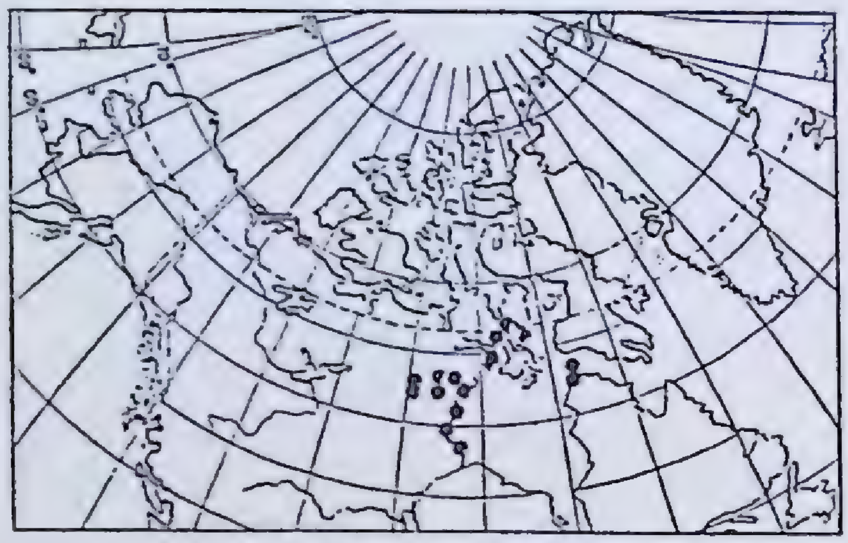
248. *Oxytropis hyperborea*



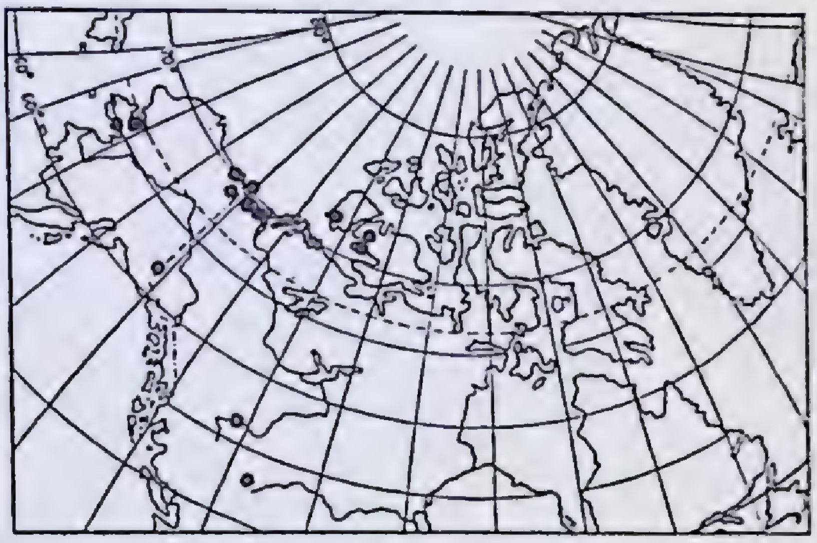
249. *Oxytropis arctica*



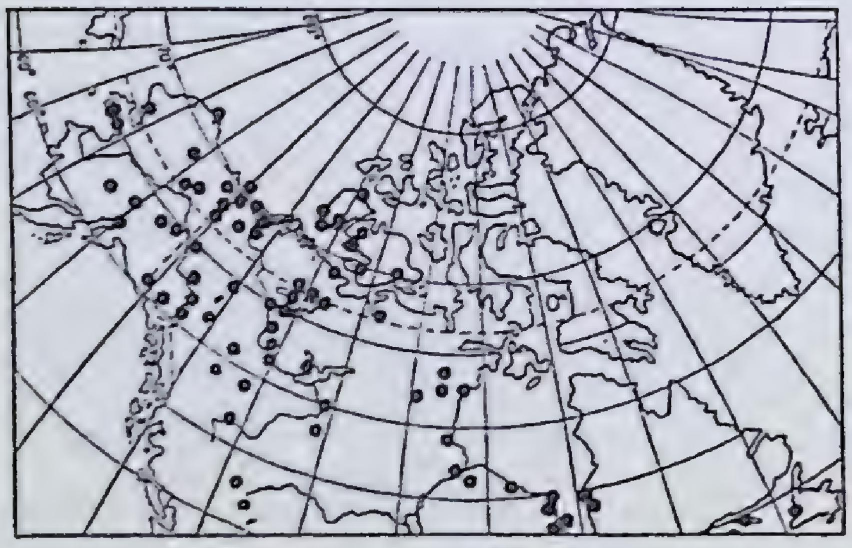
250. *Oxytropis terrae-novae*



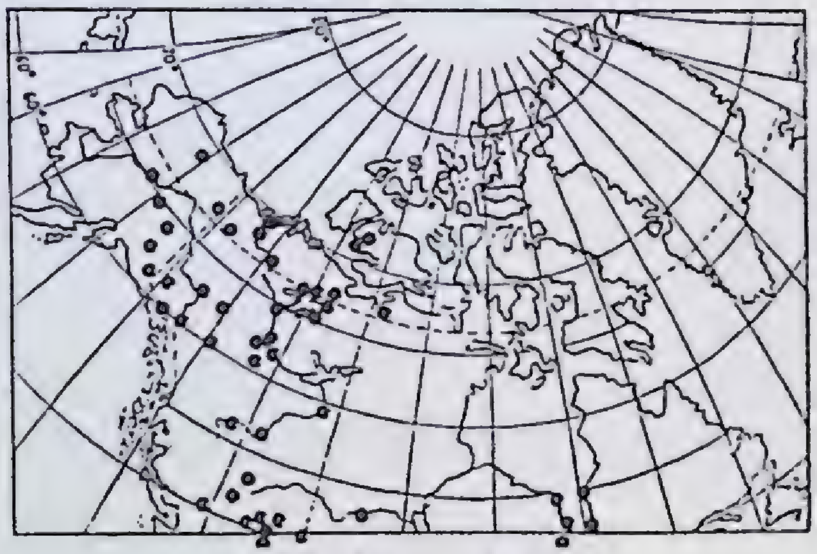
251. *Oxytropis Bellii*



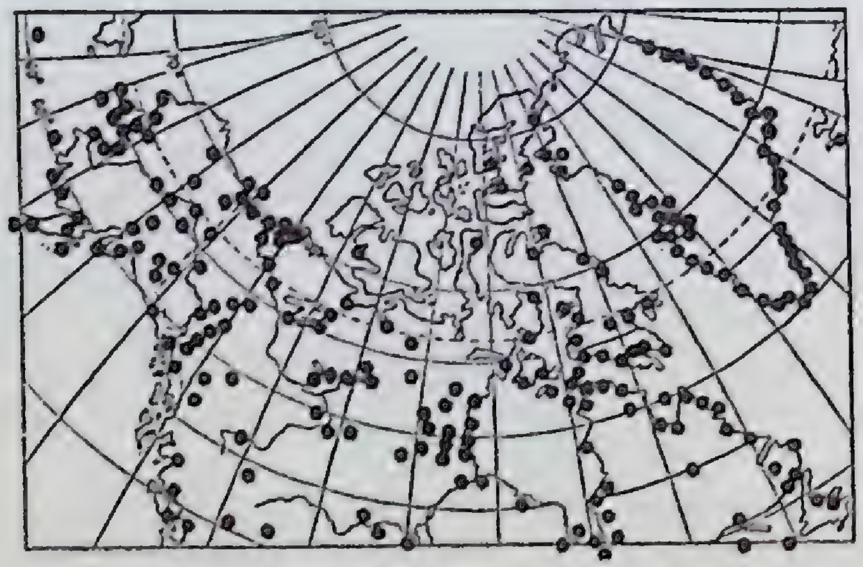
252. *Hedysarum alpinum* s. str.



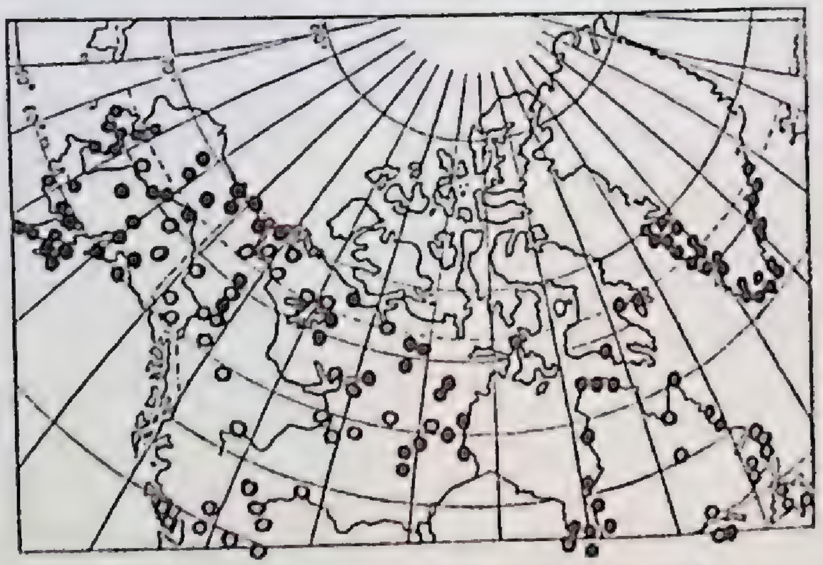
253. *Hedysarum Mackenzii*



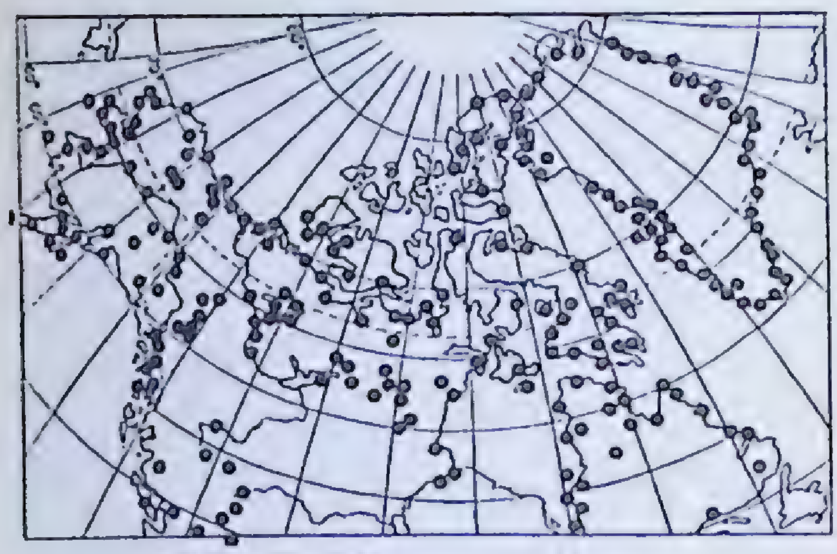
254. *Linum Lewisii*



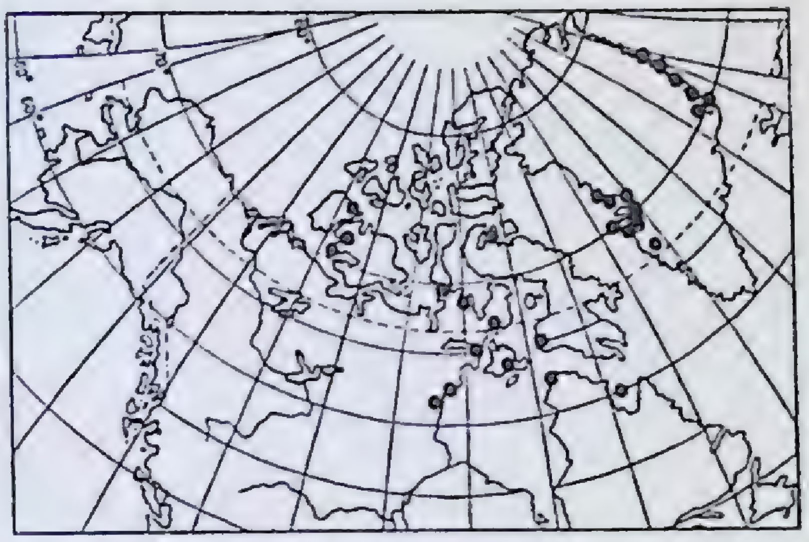
255. *Empetrum nigrum* s. lat.



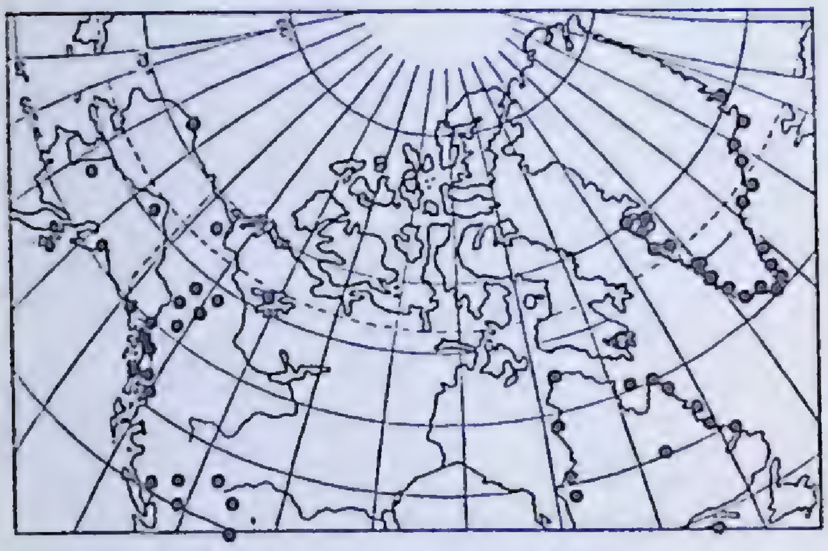
256. *Epilobium angustifolium* var.
intermedium (solid circles)
var. *typicum* (open circles)



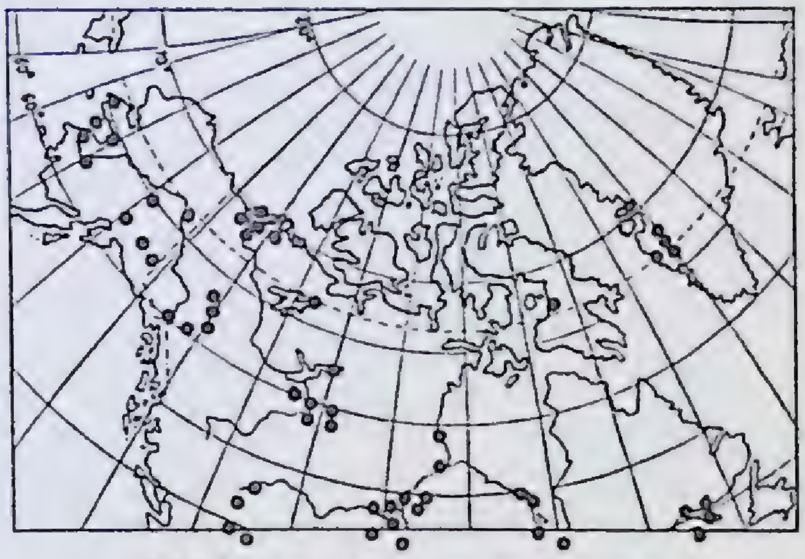
257. *Epilobium latifolium*



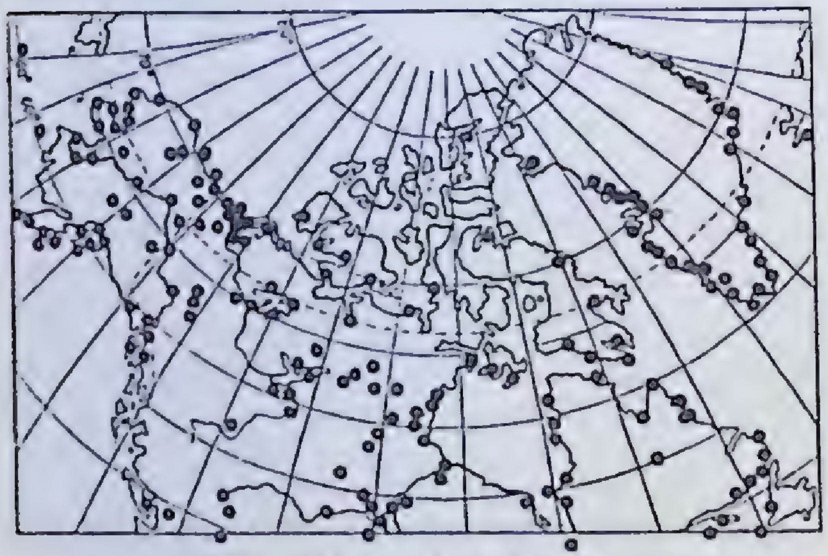
258. *Epilobium arcticum*



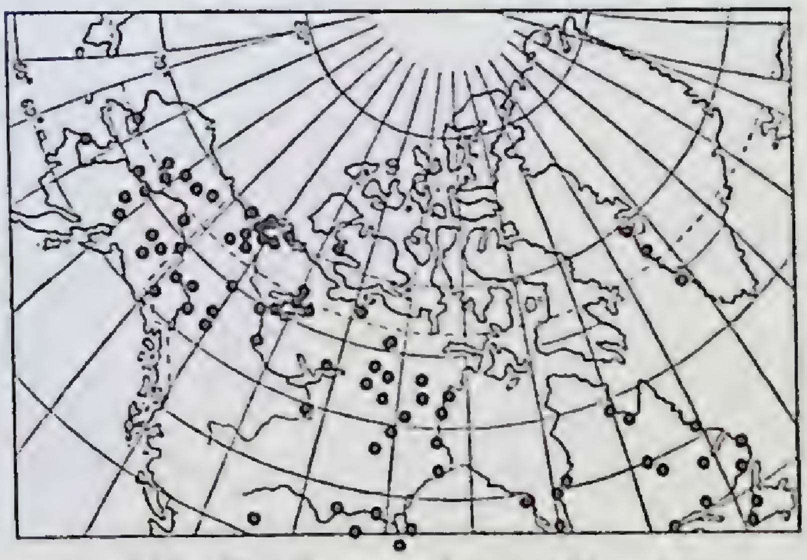
259. *Epilobium anagallidifolium*



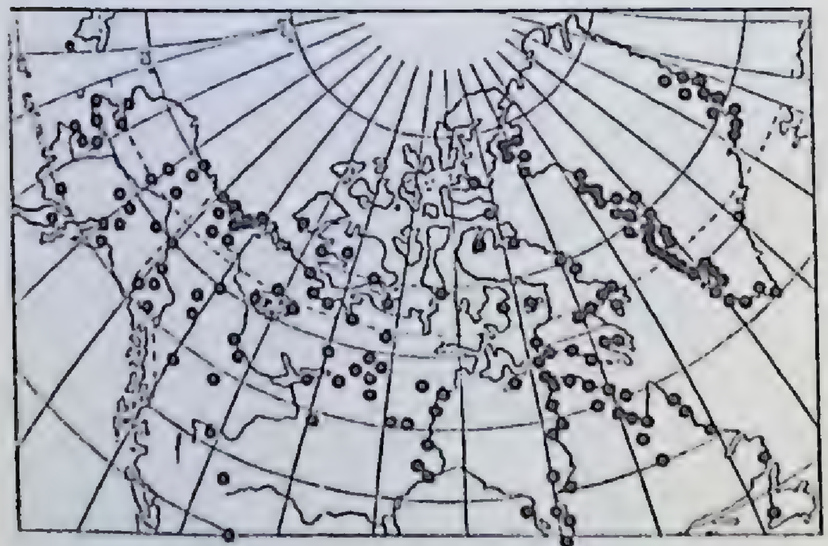
260. *Myriophyllum exalbescens*



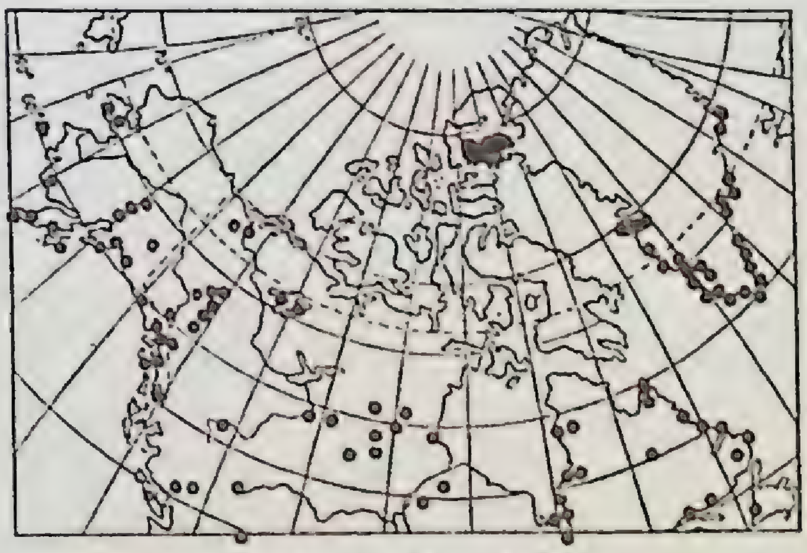
261. *Hippuris vulgaris*



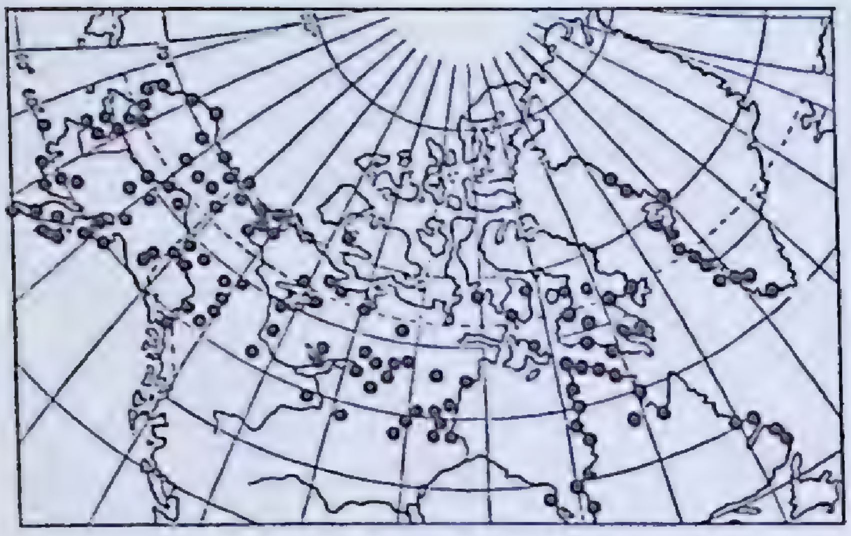
262. *Pyrola secunda var. obtusata*



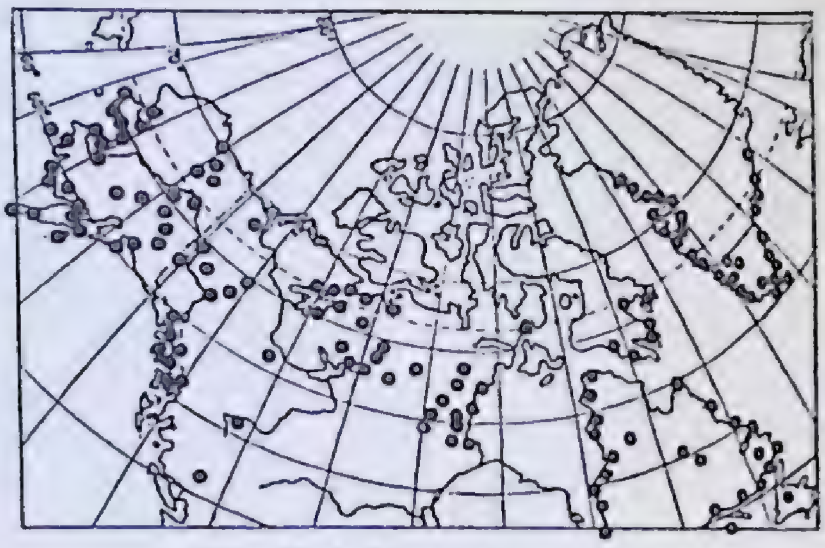
263. *Pyrola grandiflora*



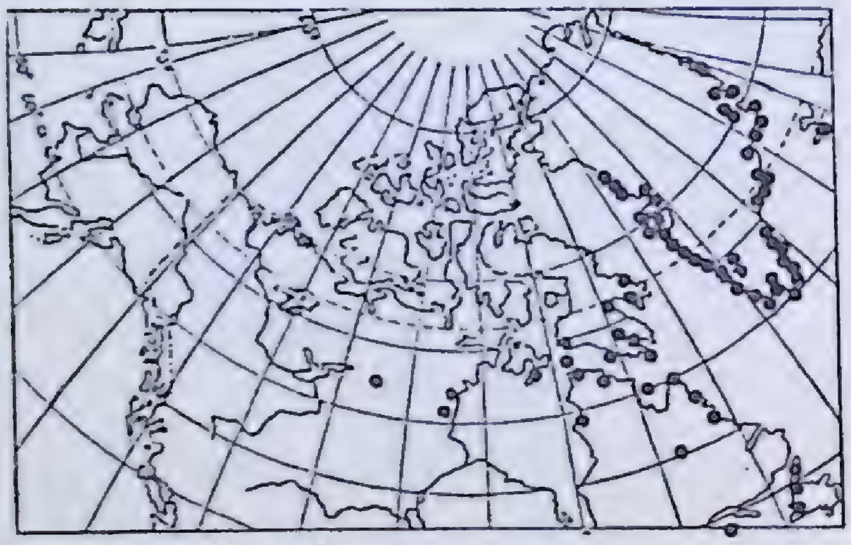
264. *Pyrola minor*



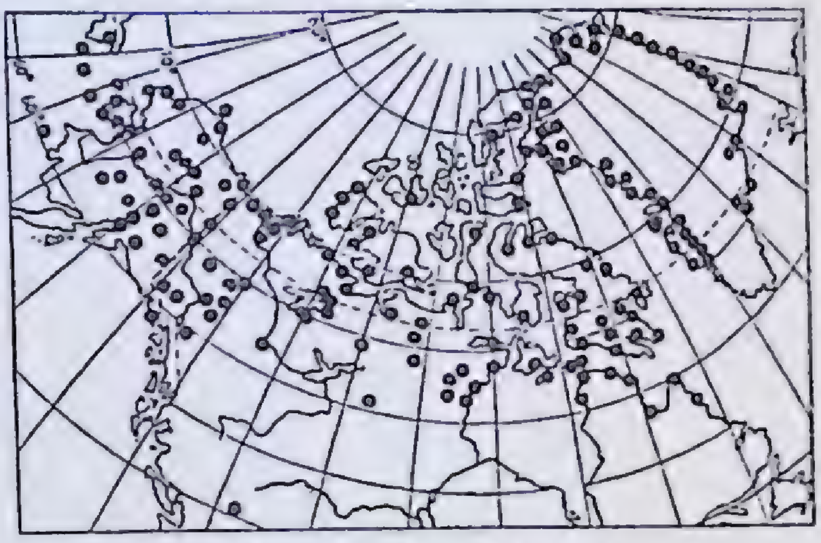
265. *Ledum decumbens*



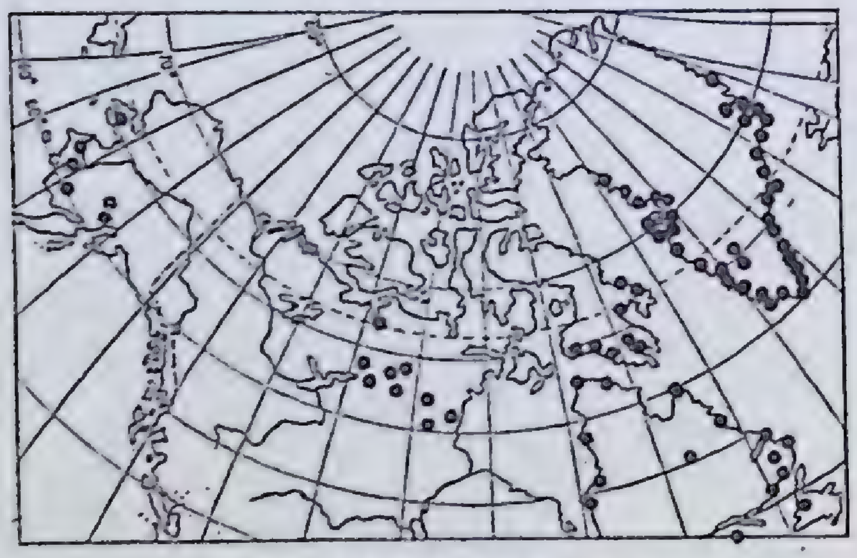
266. *Loiseleuria procumbens*



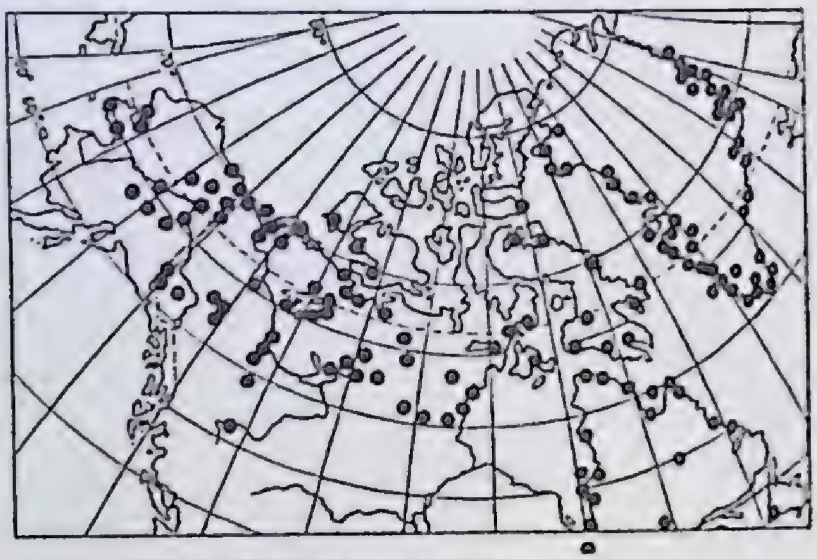
267. *Cassiope hypnoides*



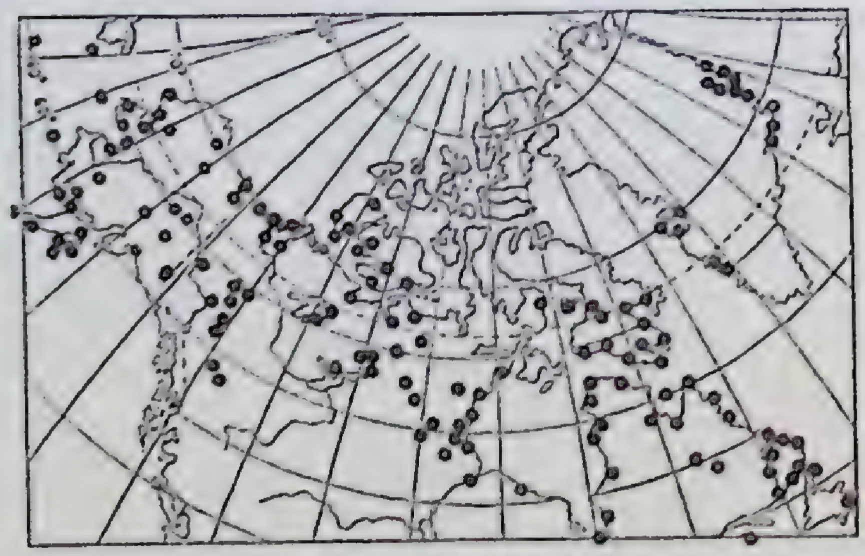
268. *Cassiope tetragona*



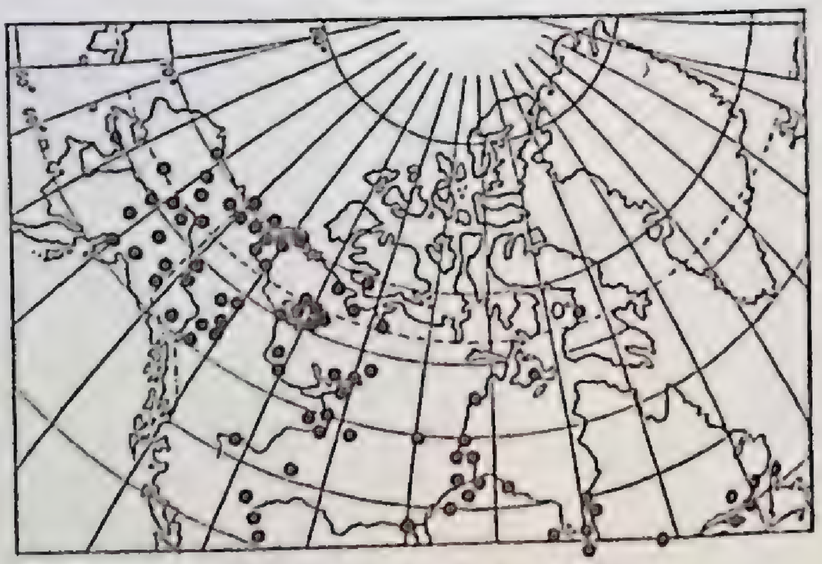
269. *Phyllodoce coerulea*



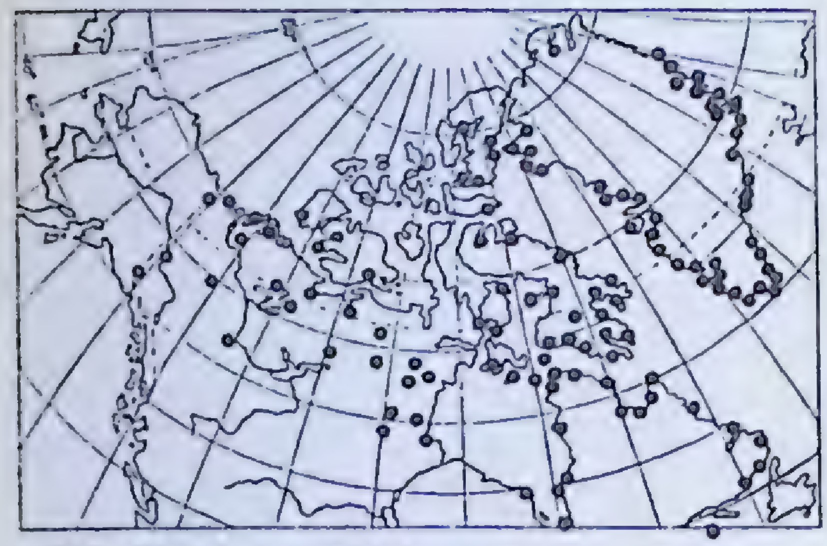
270. *Rhodendron lapponicum*



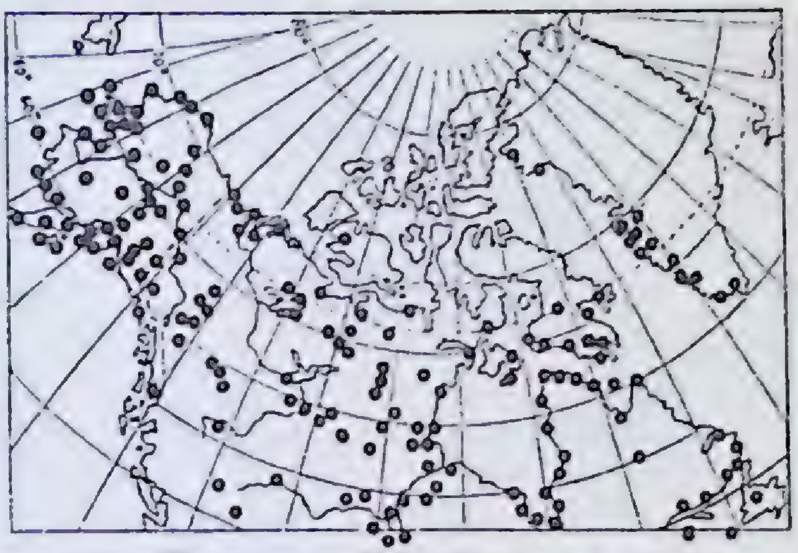
271. *Arctostaphylos alpina*



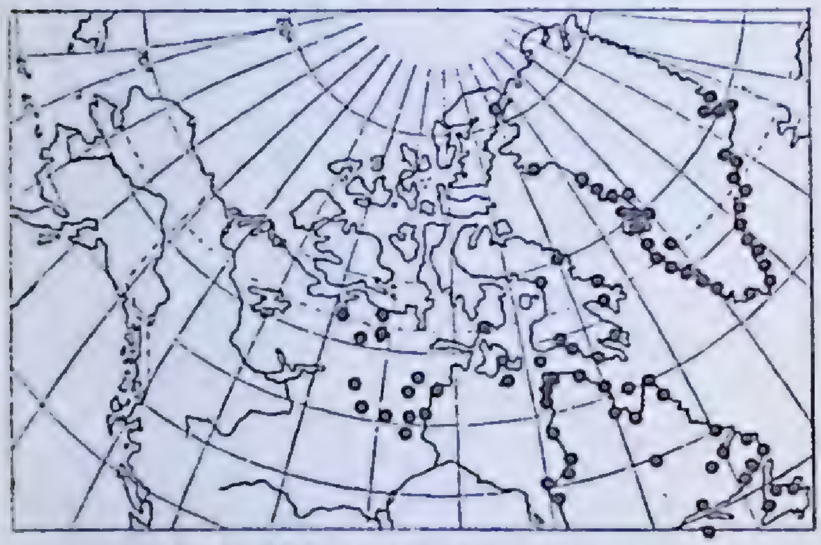
272. *Arctostaphylos rubra*



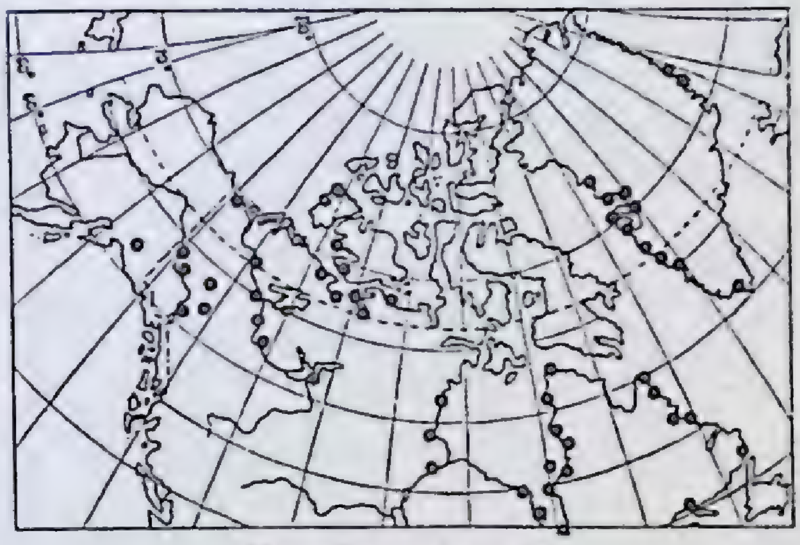
273. *Vaccinium uliginosum* var. *alpinum*



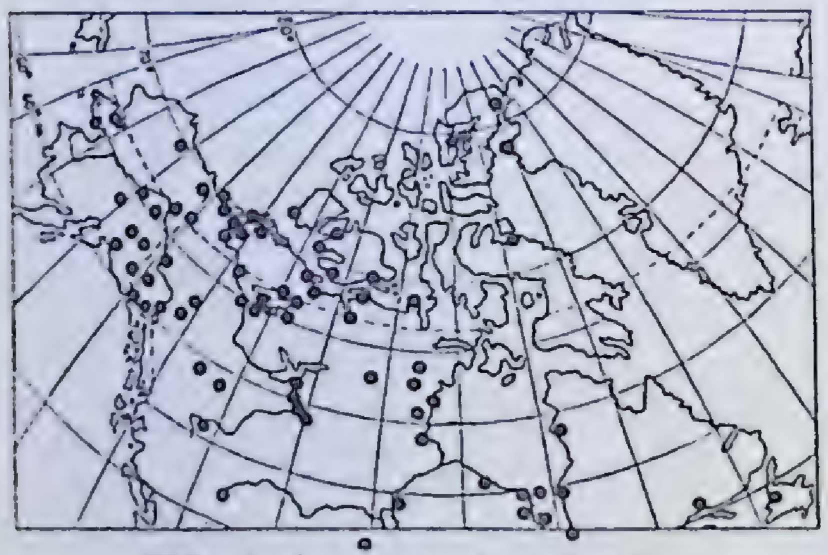
274. *Vaccinium Vitis-idaea* var. *minus*



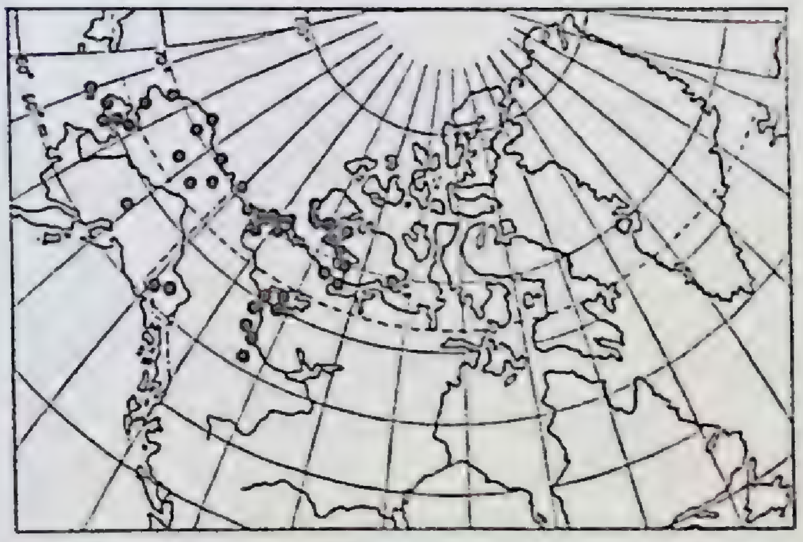
275. *Diapensia lapponica*



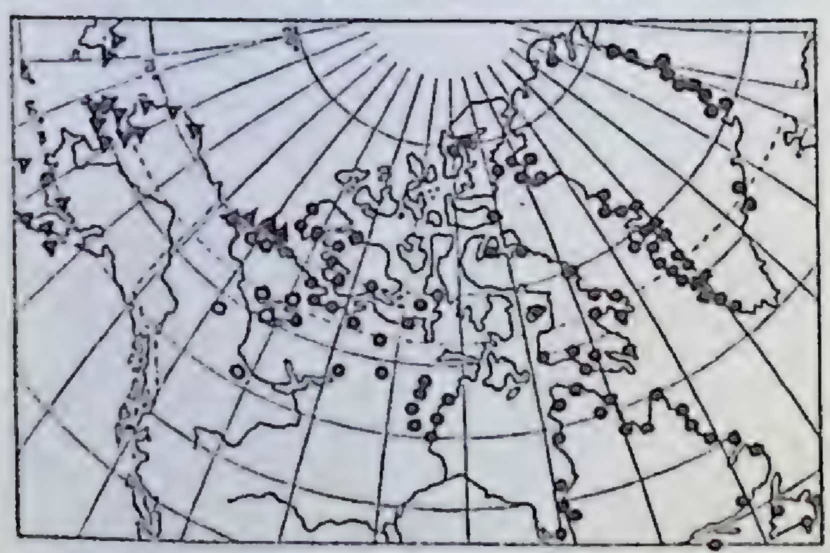
276. *Primula stricta*



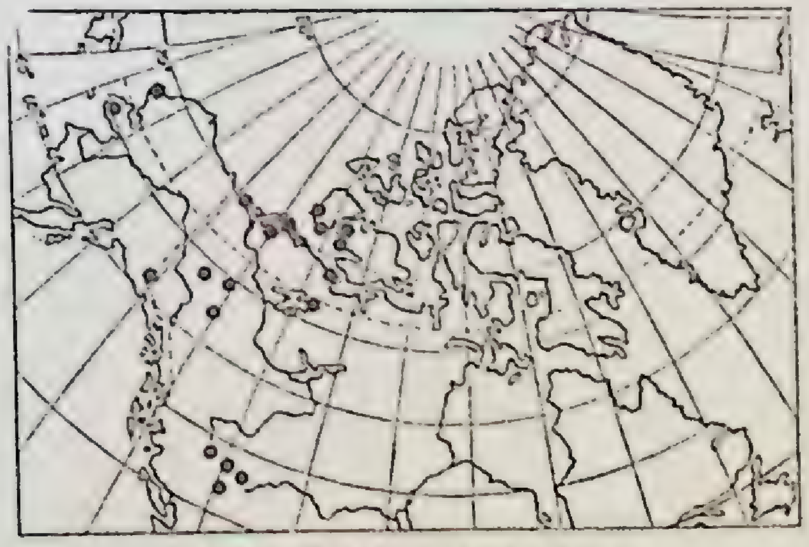
277. *Androsace septentrionalis*



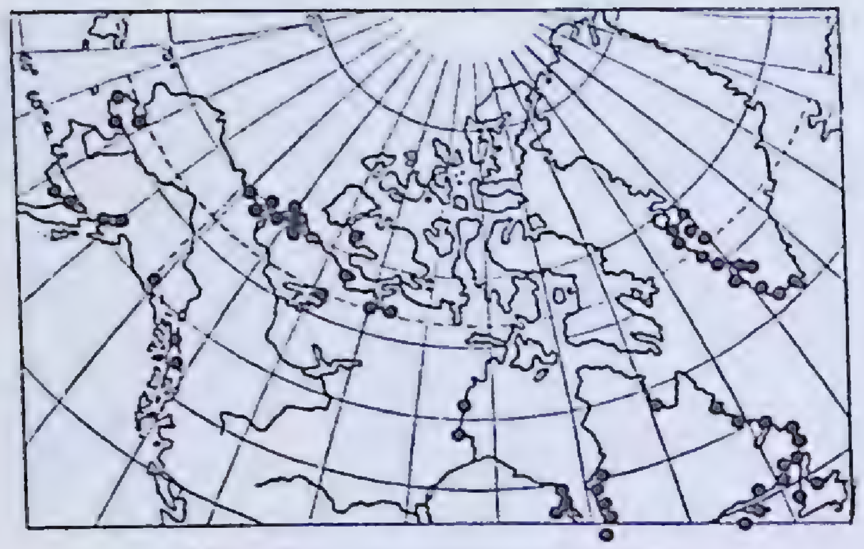
278. *Androsace Chamaejasme* var. *arctica*



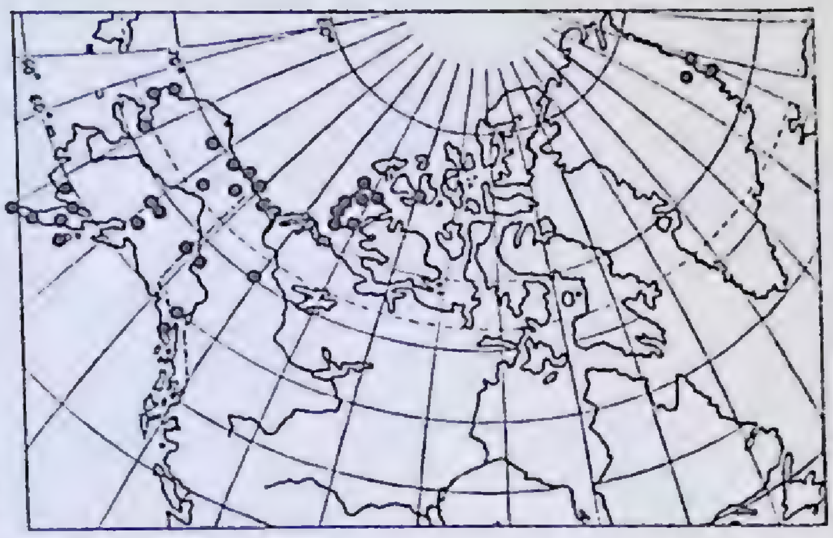
279. *Armeria maritima* ssp. *labradorica* (solid circles); ssp. *arctica* (triangles); intermediate toward ssp. *arctica* (open circles)



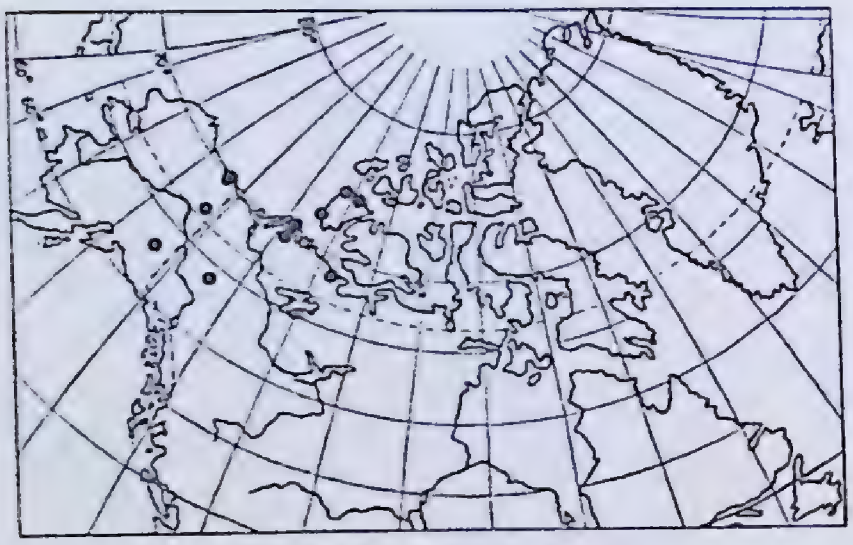
280. *Gentiana arctophila*



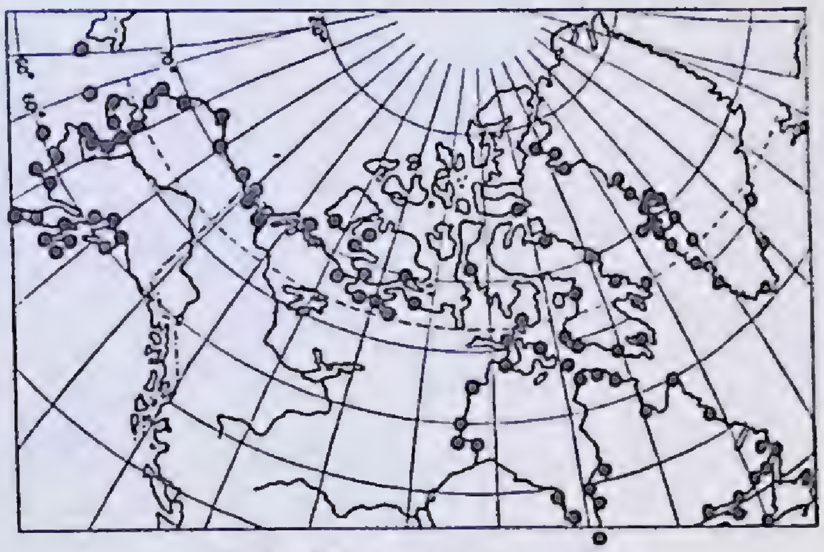
281. *Lomatogonium rotatum*



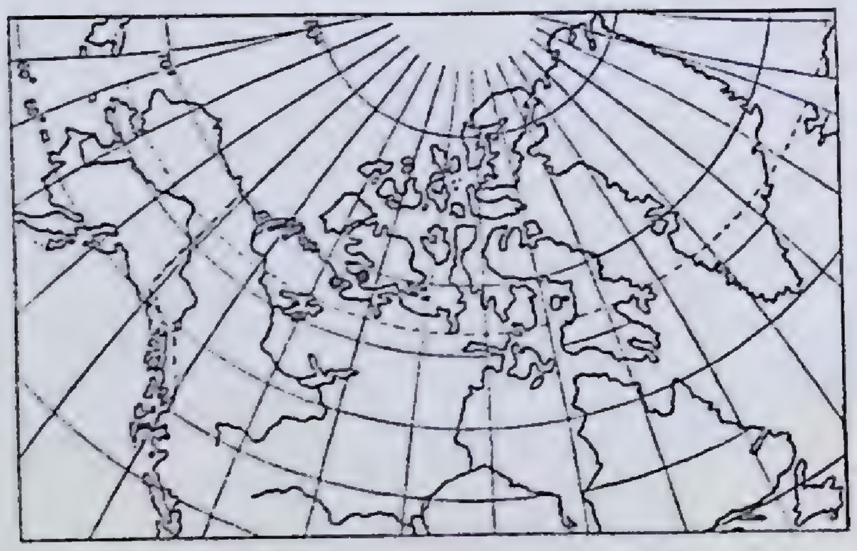
282. *Polemonium boreale*



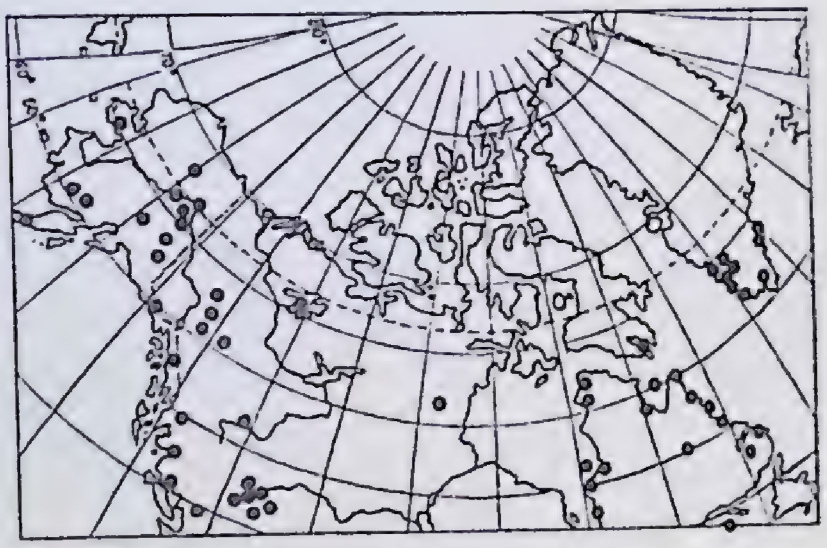
283. *Phlox Richardsonii*



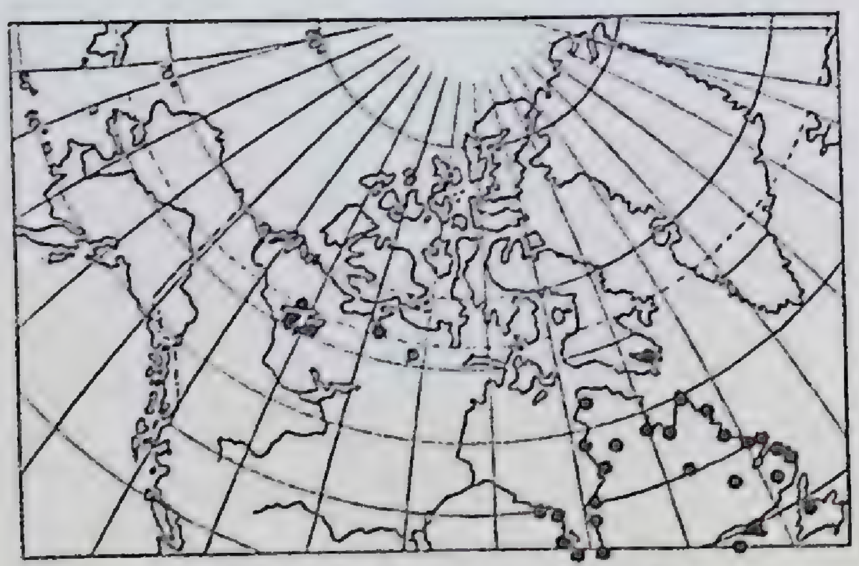
284. *Mertensia maritima*



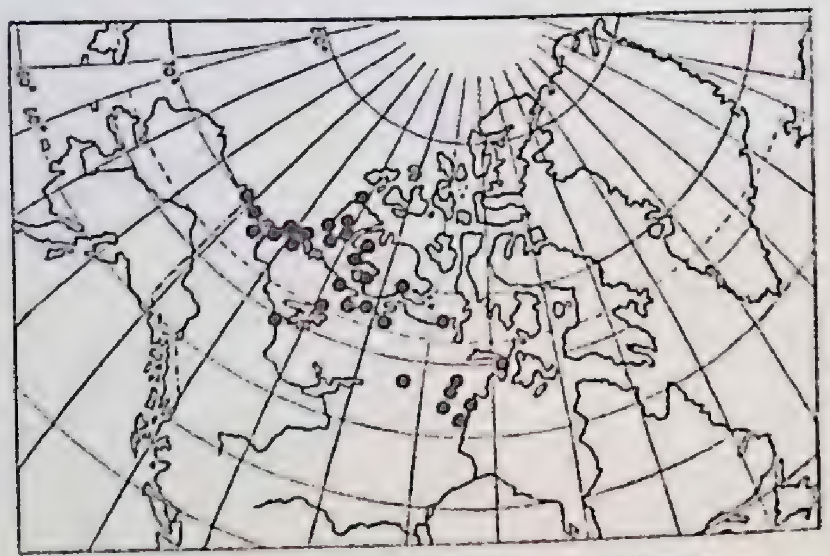
285. *Mertensia Drummondii*



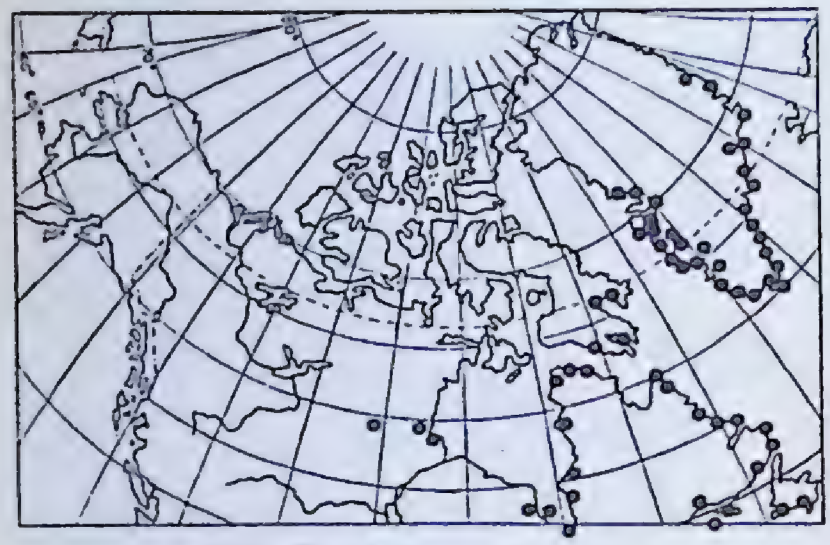
286. *Veronica alpina* var. *unalaschcensis*



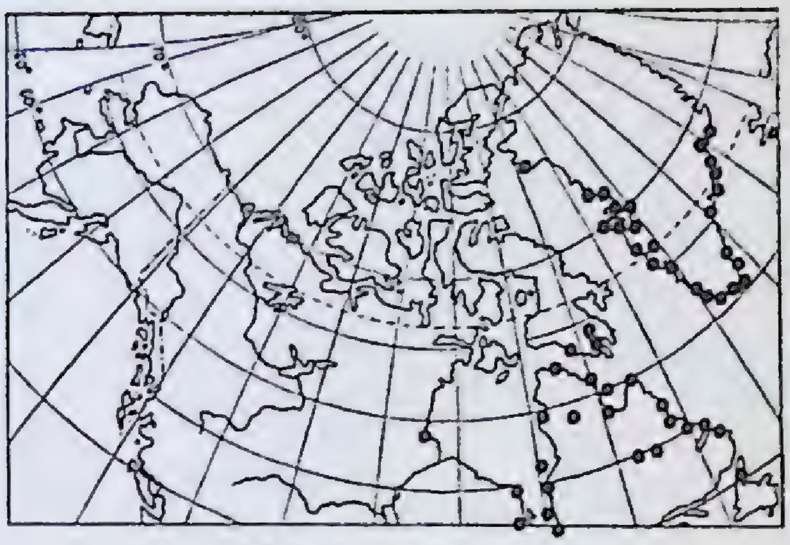
287. *Castilleja septentrionalis*



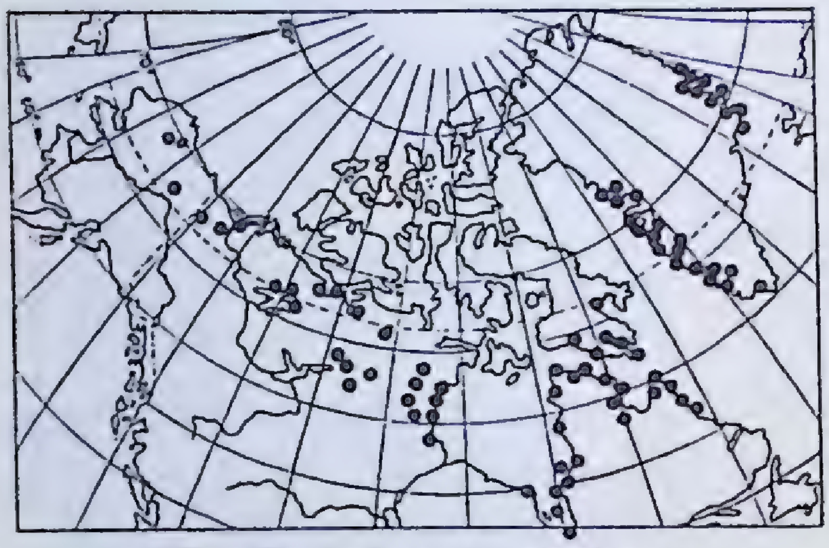
288. *Castilleja pallida* ssp. *elegans*



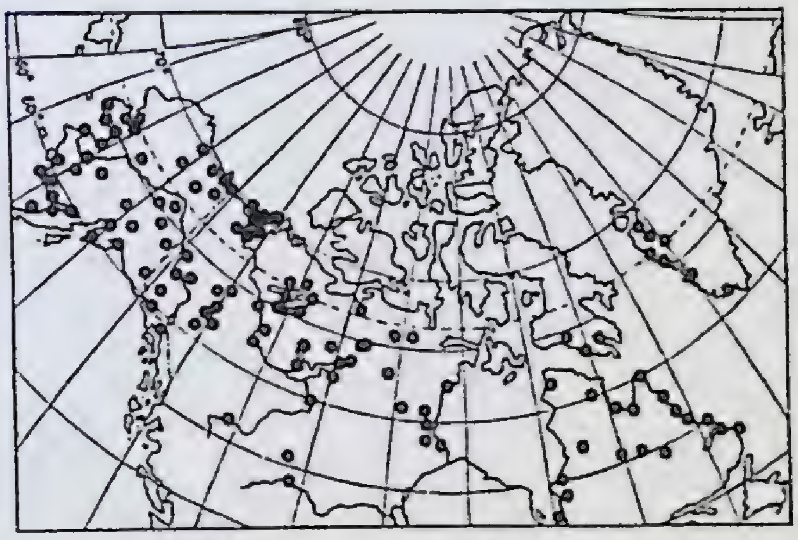
289. *Euphrasia arctica*



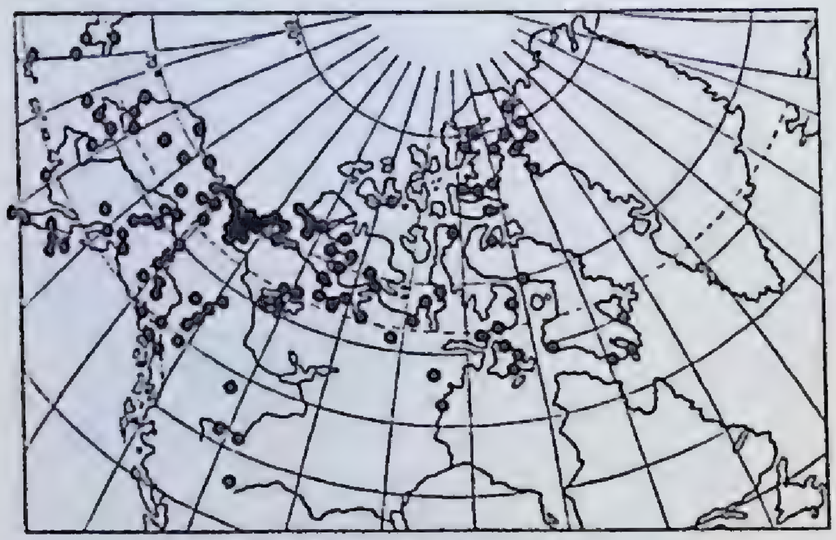
290. *Bartsia alpina*



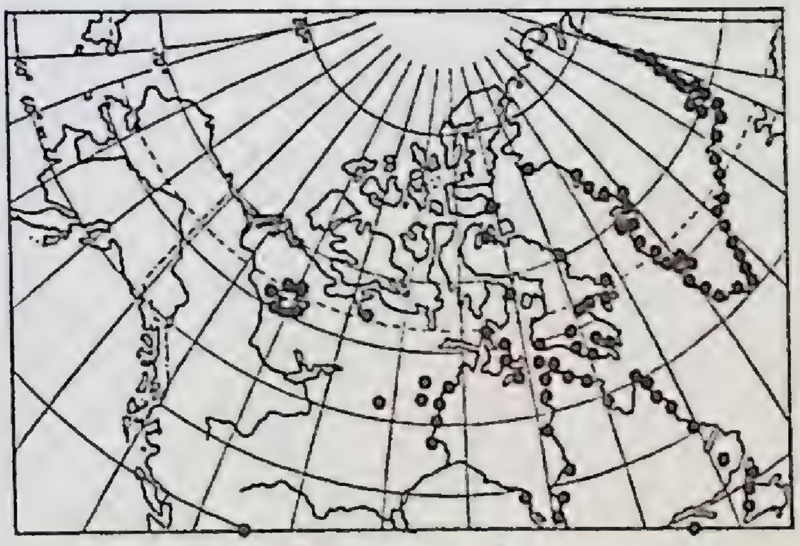
291. *Pedicularis lapponica*



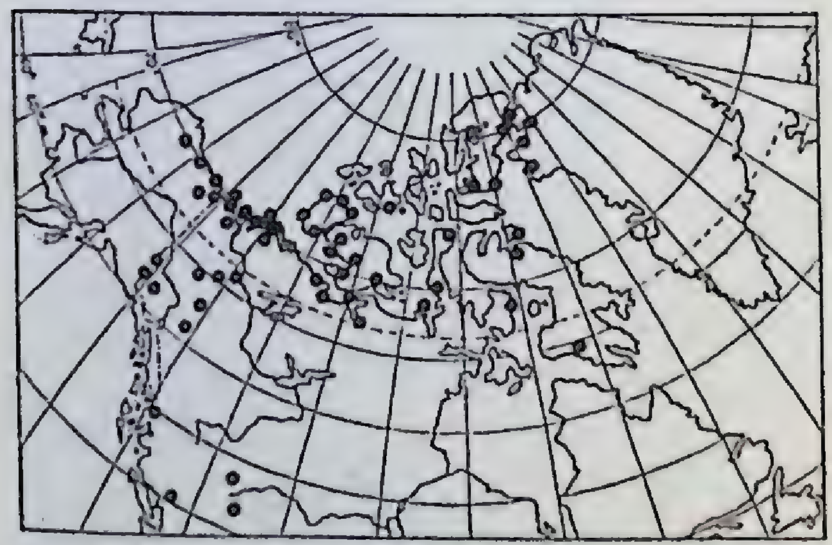
292. *Pedicularis labradorica*



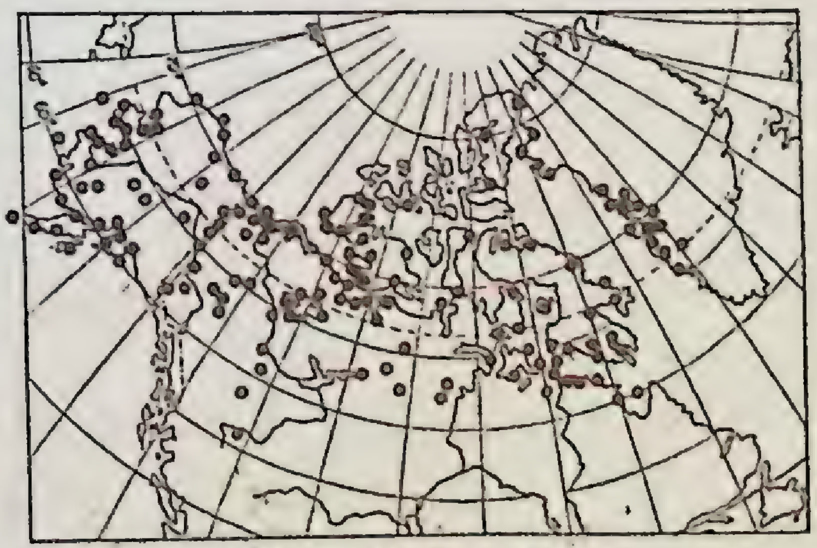
293. *Pedicularis capitata*



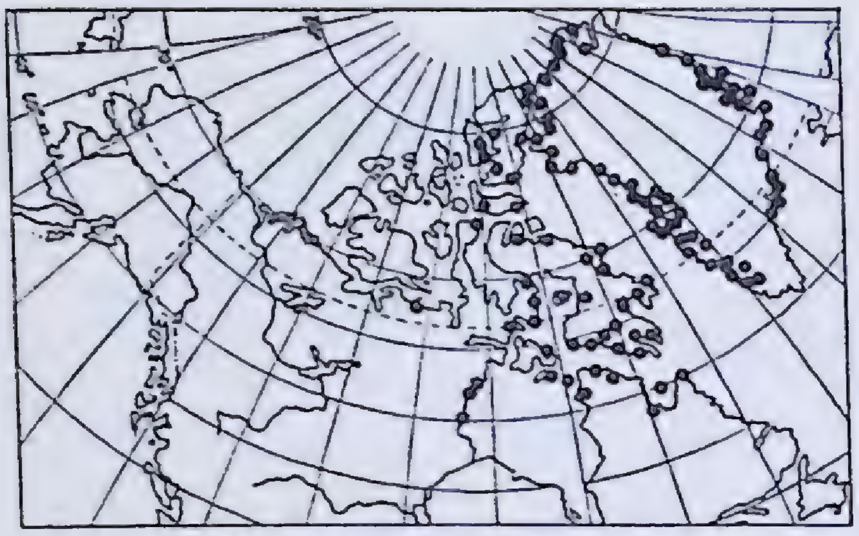
294. *Pedicularis flammea*



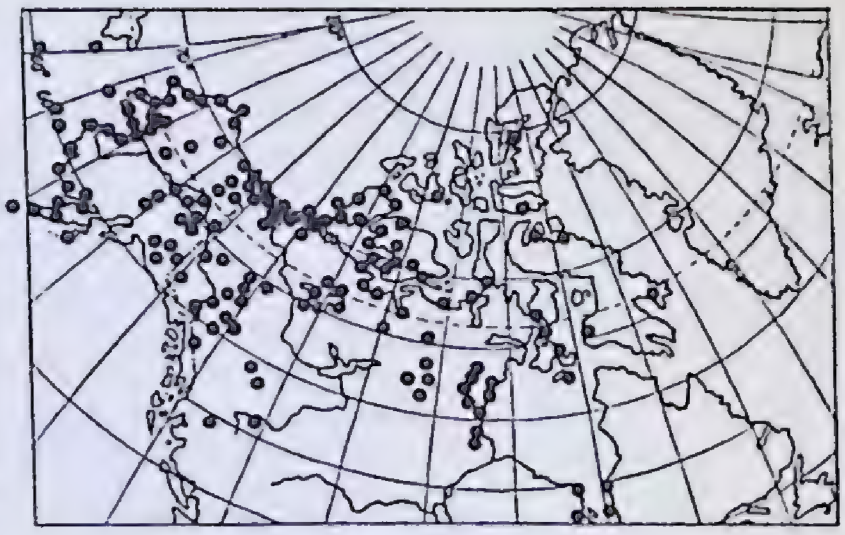
295. *Pedicularis arctica*



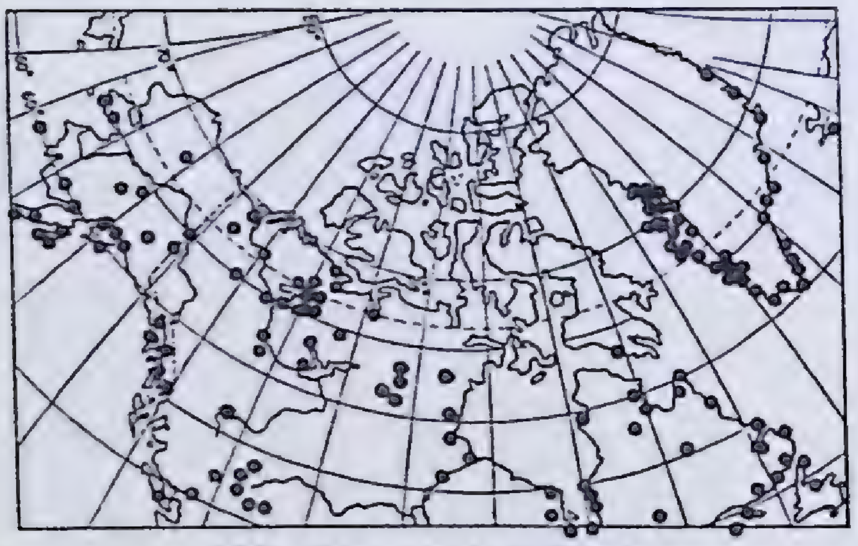
296. *Pedicularis lanata*



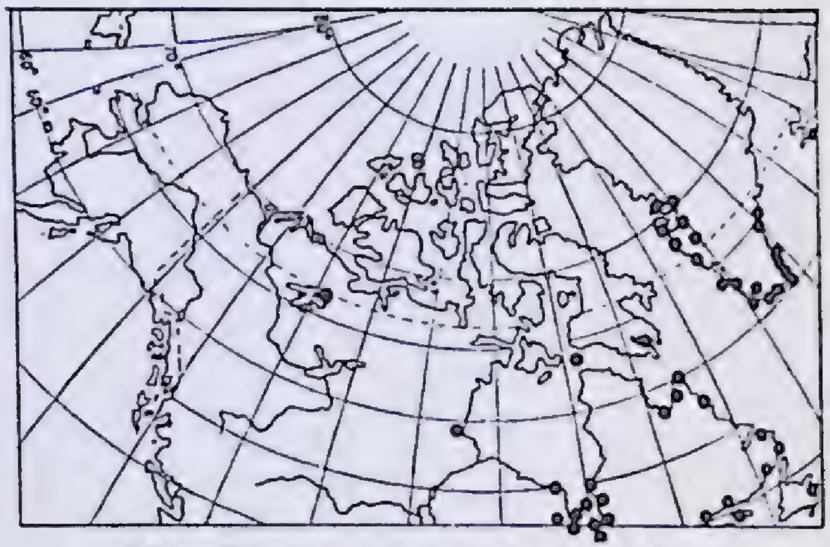
297. *Pedicularis hirsuta*



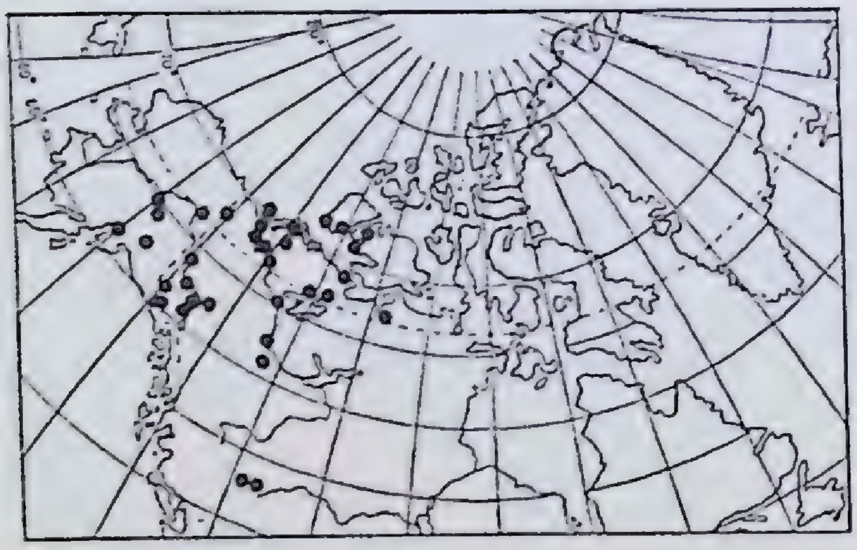
298. *Pedicularis sudetica*



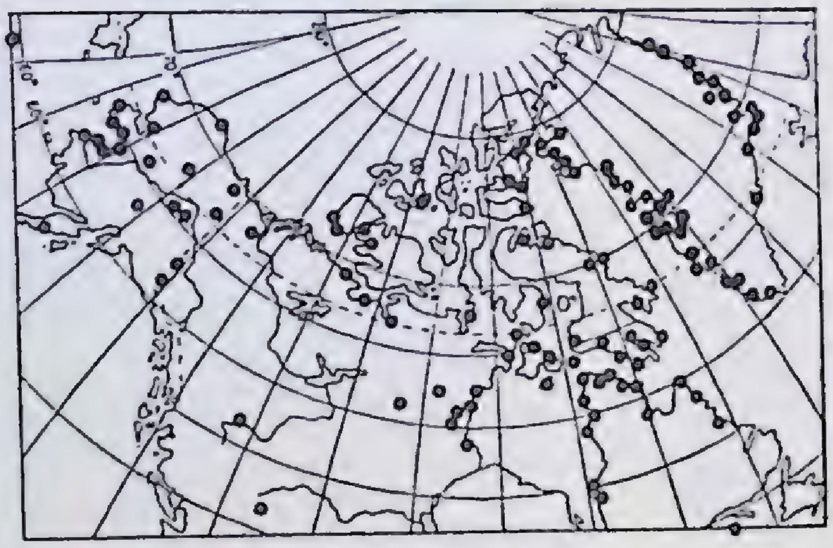
299. *Pinguicula vulgaris*



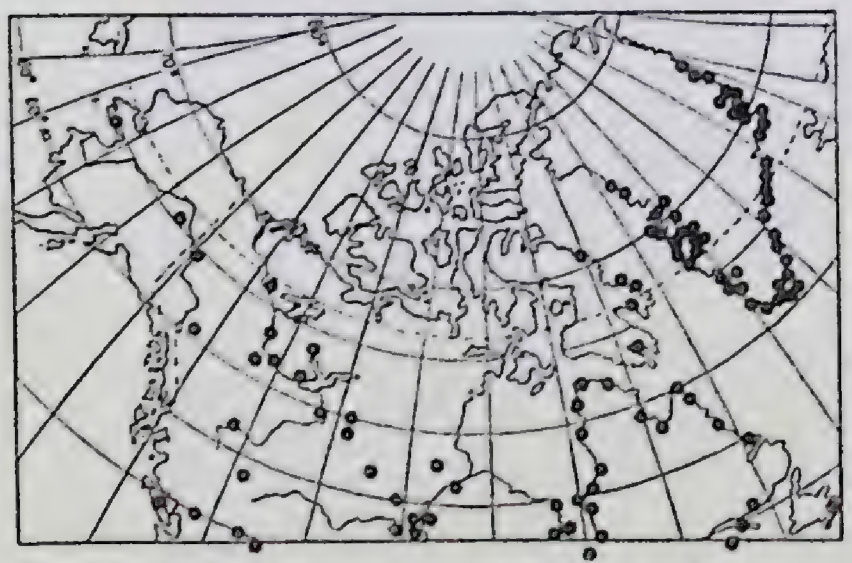
300. *Plantago juncoides* var. *glauca*



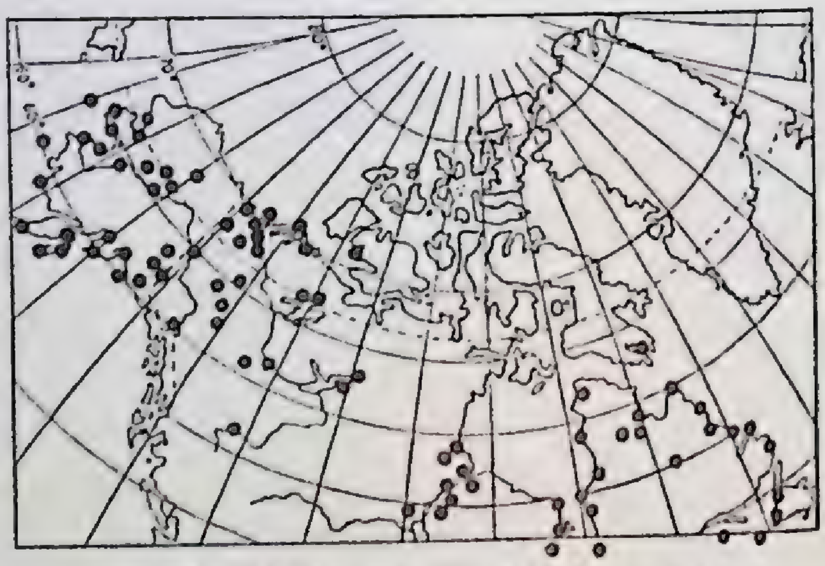
301. *Plantago septata*



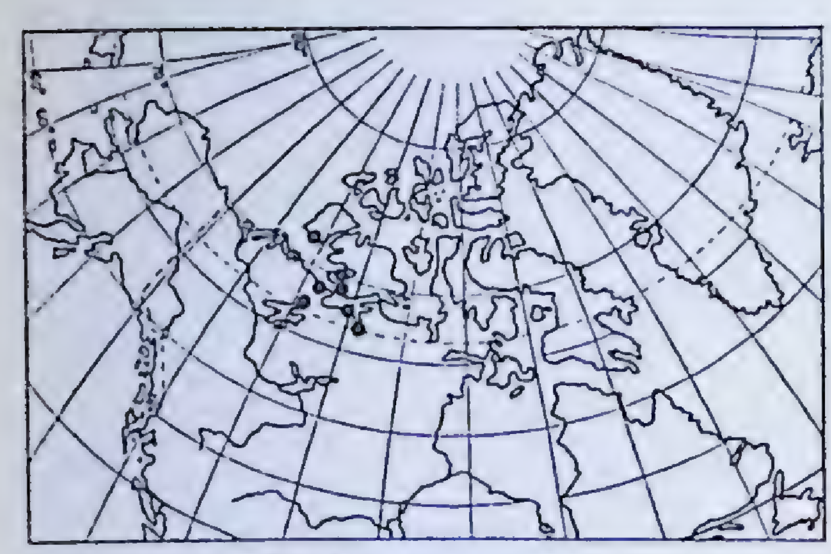
302. *Campanula uniflora*



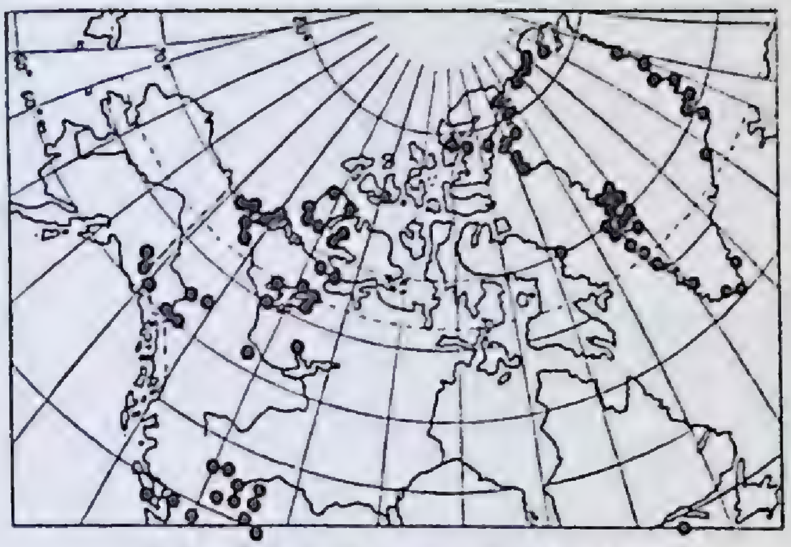
303. *Campanula rotundifolia* s. lat.



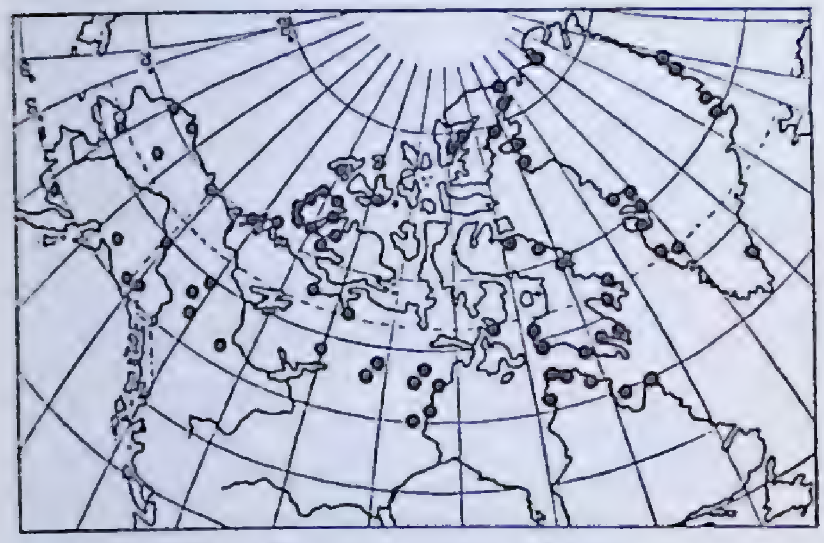
304. *Solidago multiradiata* s. str.



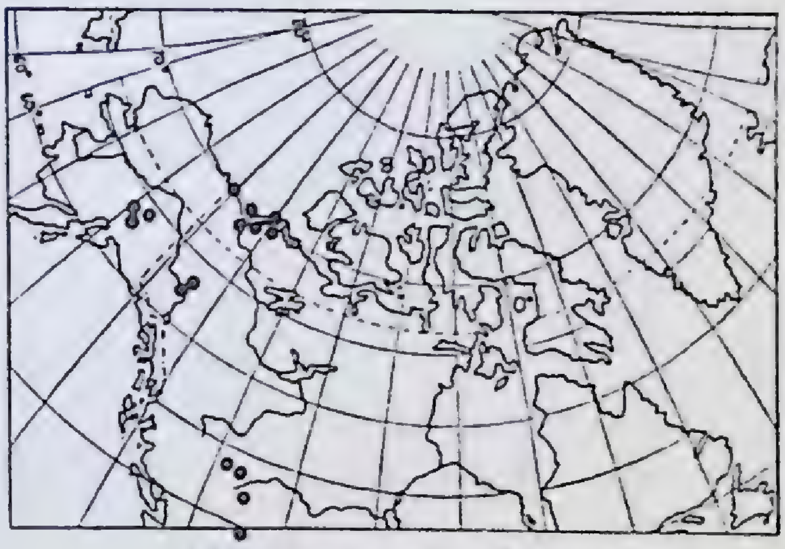
305. *Aster pygmaeus*



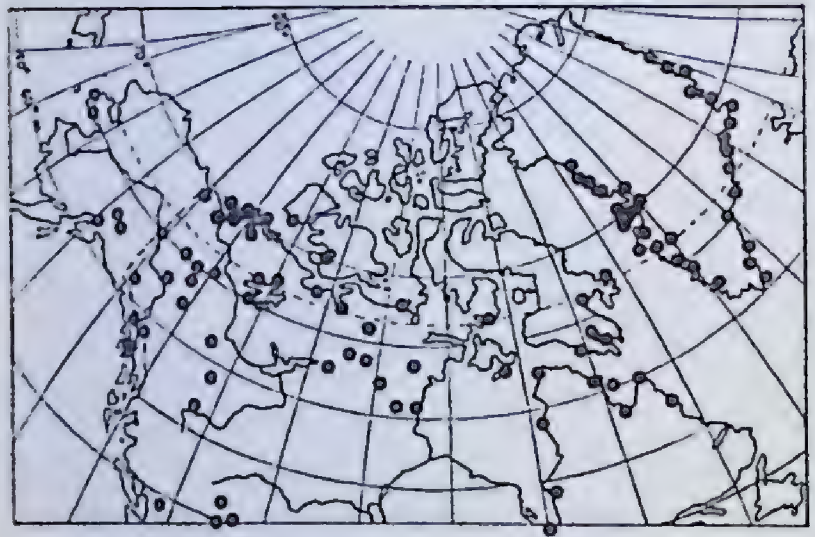
306. *Erigeron compositus* s. lat.



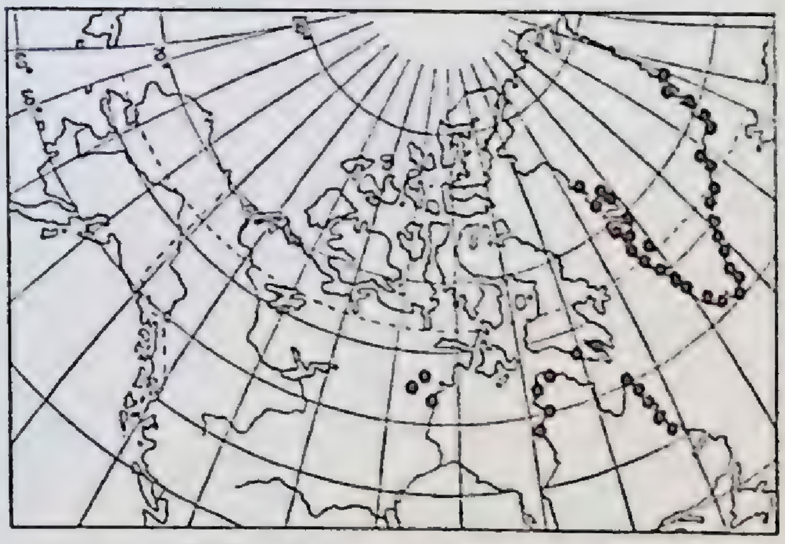
307. *Erigeron eriocephalus*



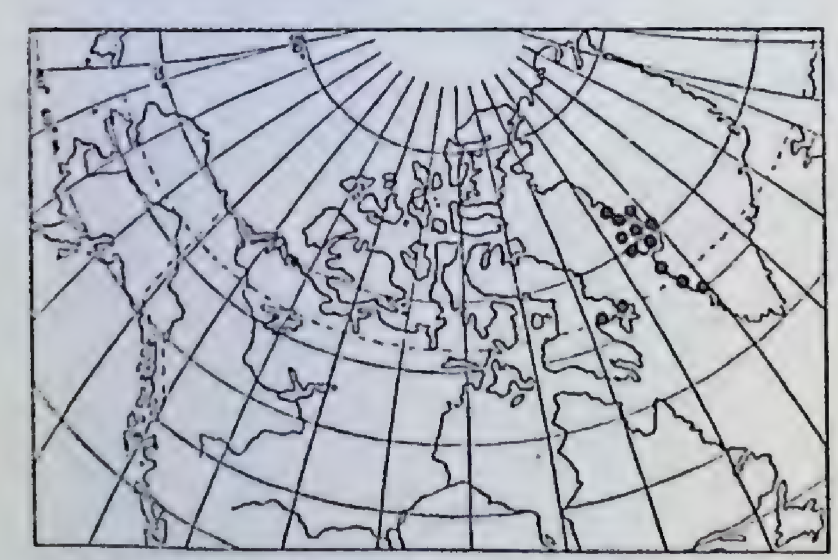
308. *Erigeron grandiflorus*



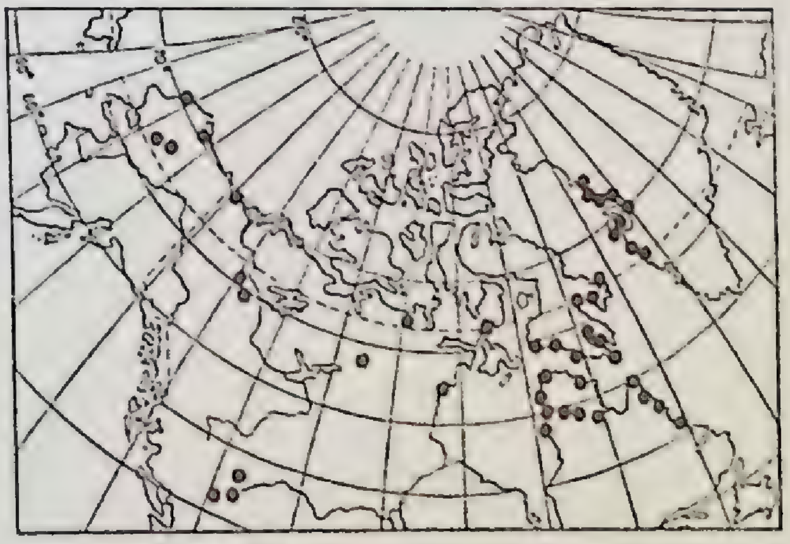
309. *Erigeron unalaschkensis*



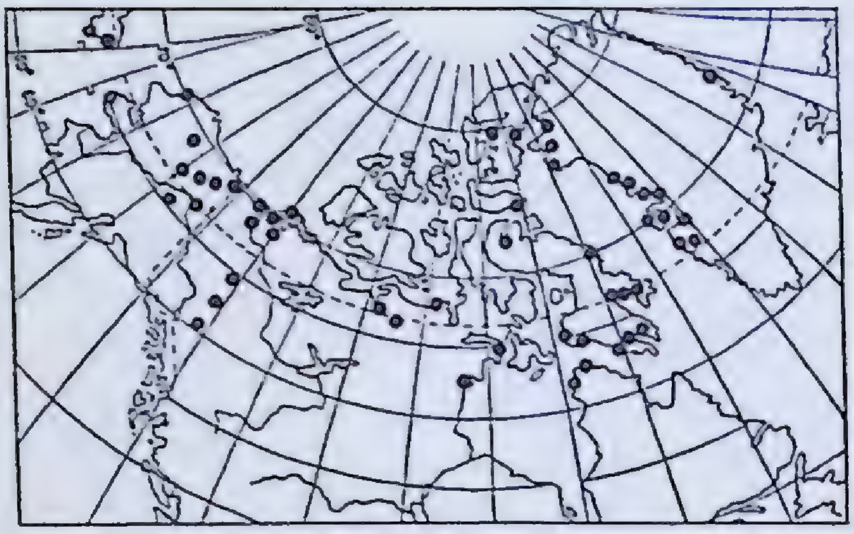
310. *Antennaria canescens*

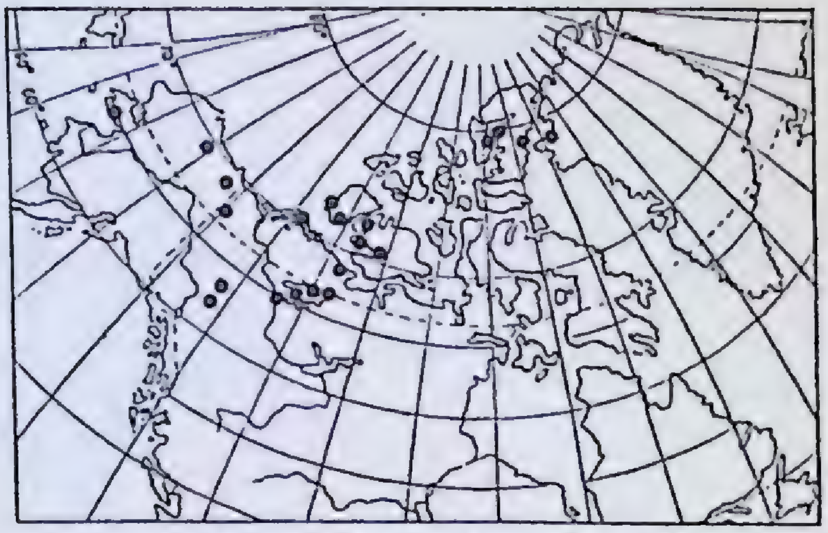


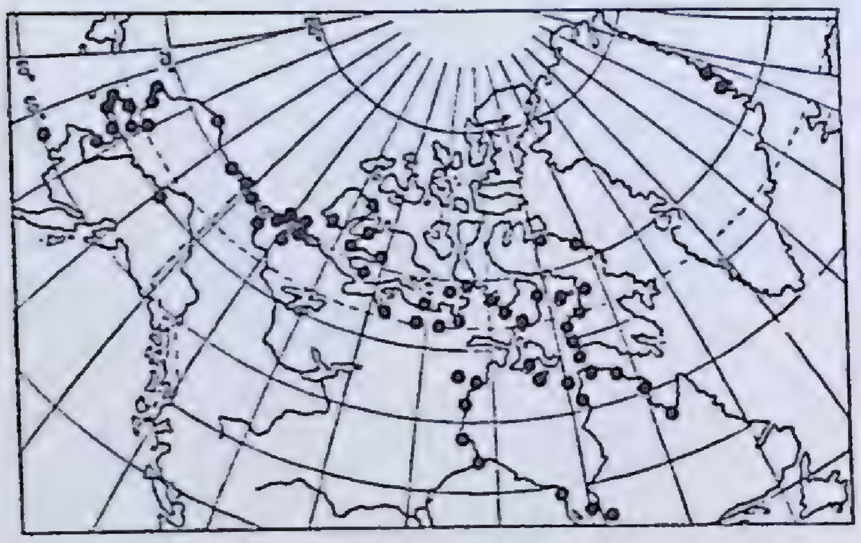
311. *Antennaria glabrata*

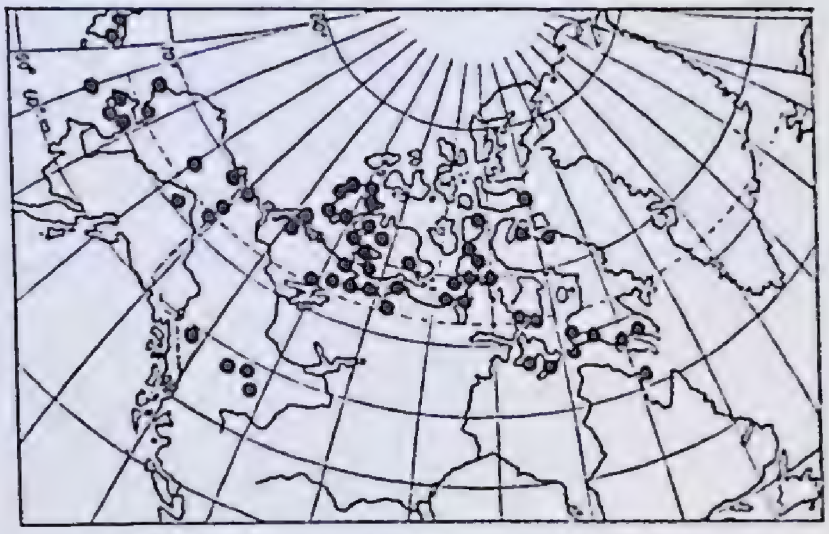


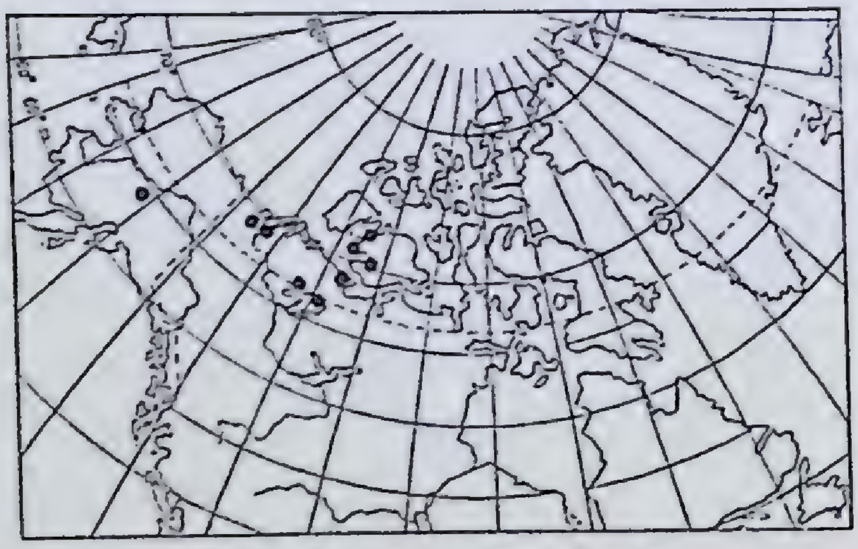
312. *Antennaria angustata*

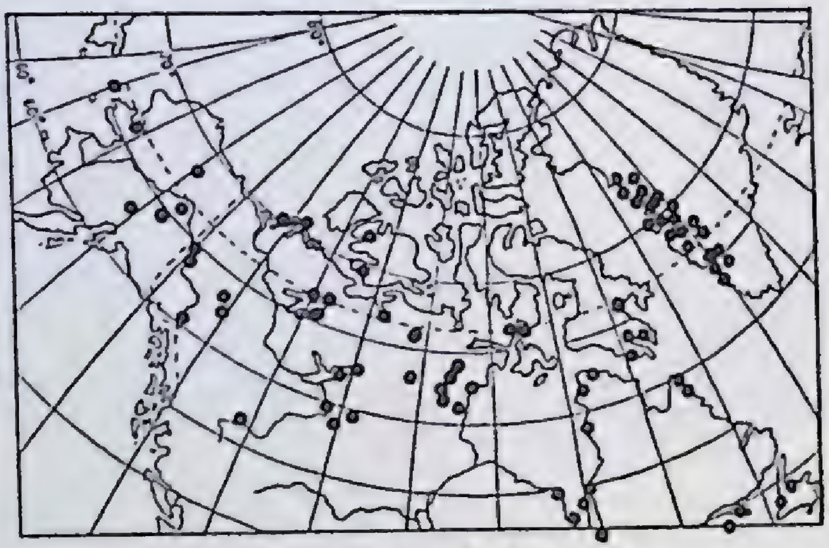

313. *Antennaria Ekmaniana*

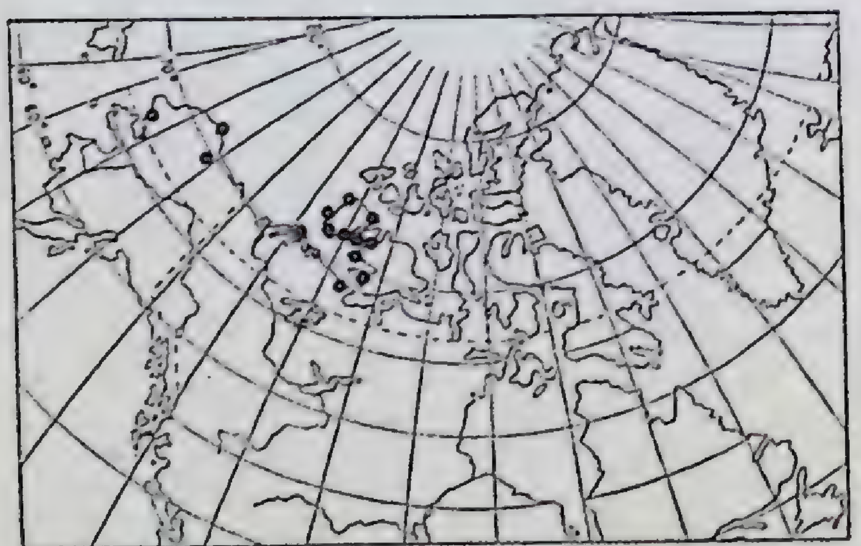

314. *Antennaria compacta*

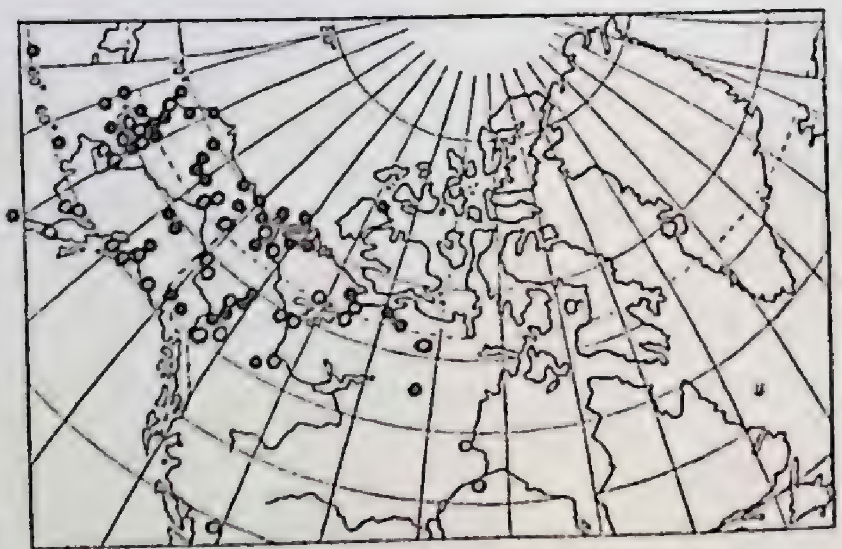

315. *Matricaria ambigua*

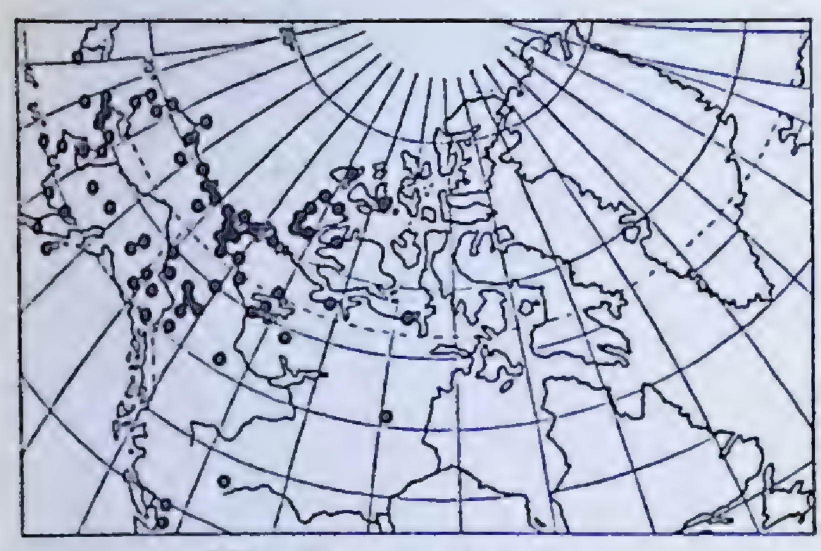

316. *Chrysanthemum integrifolium*


317. *Artemisia hyperborea*

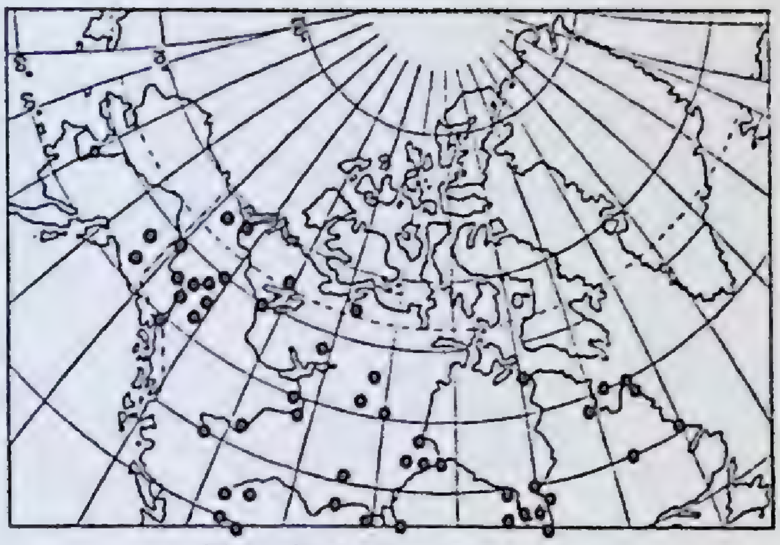

318. *Artemisia borealis*


319. *Artemisia Richardsoniana*

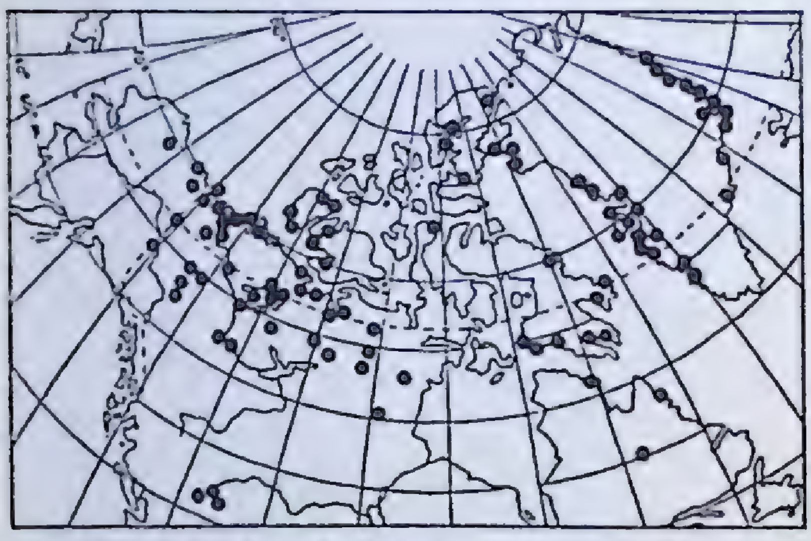

320. *Artemisia Tilesii* (solid circles); var. *elatior* (open circles)



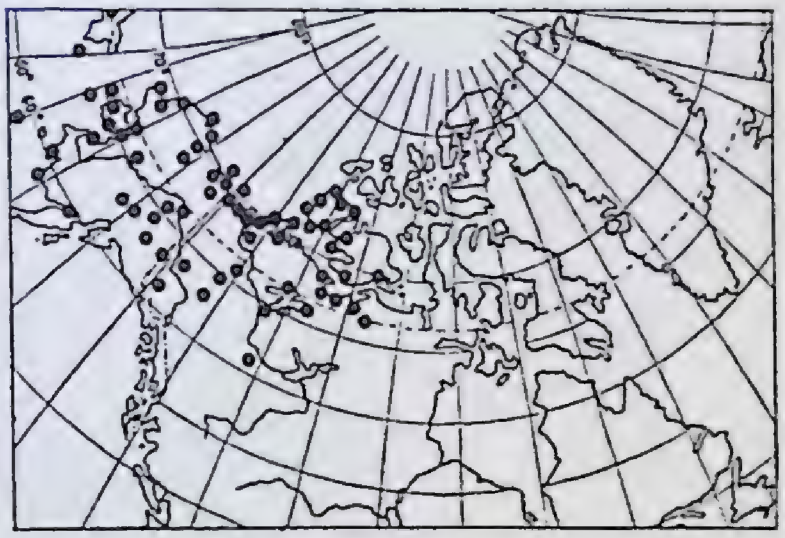
321. *Petasites frigidus*



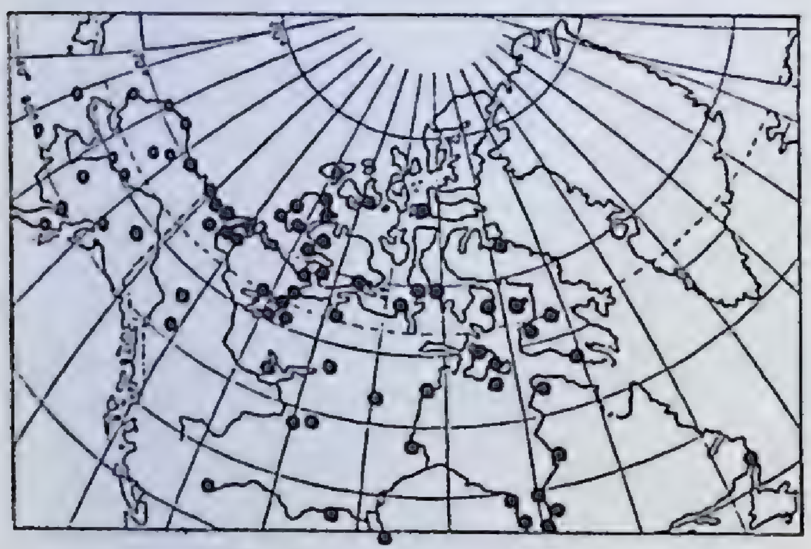
322. *Petasites sagittatus*



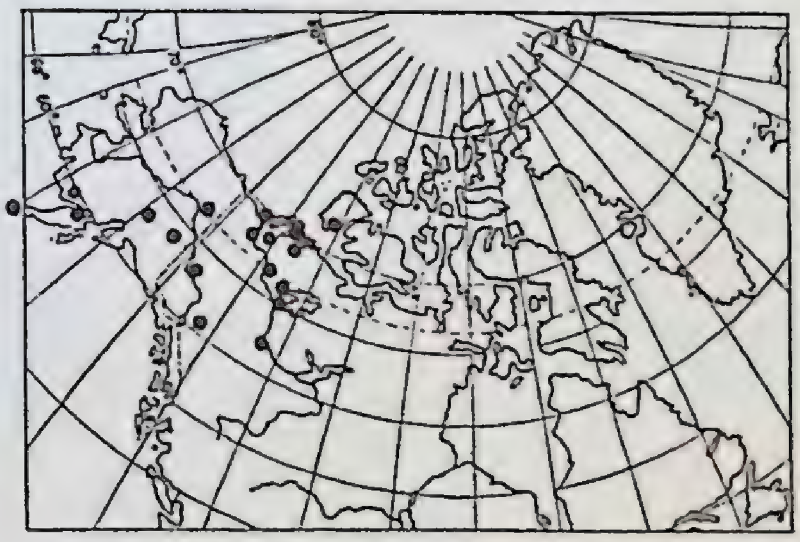
323. *Arnica alpina* ssp. *angustifolia*



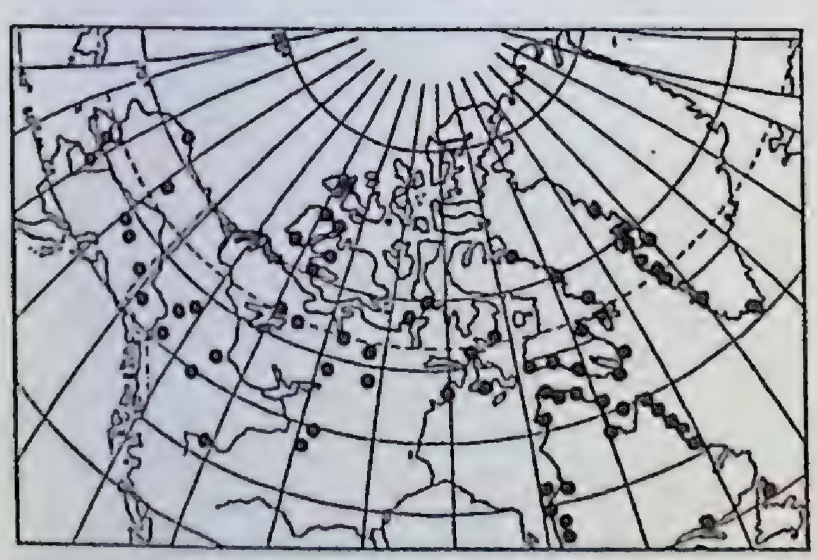
324. *Senecio atropurpureus*



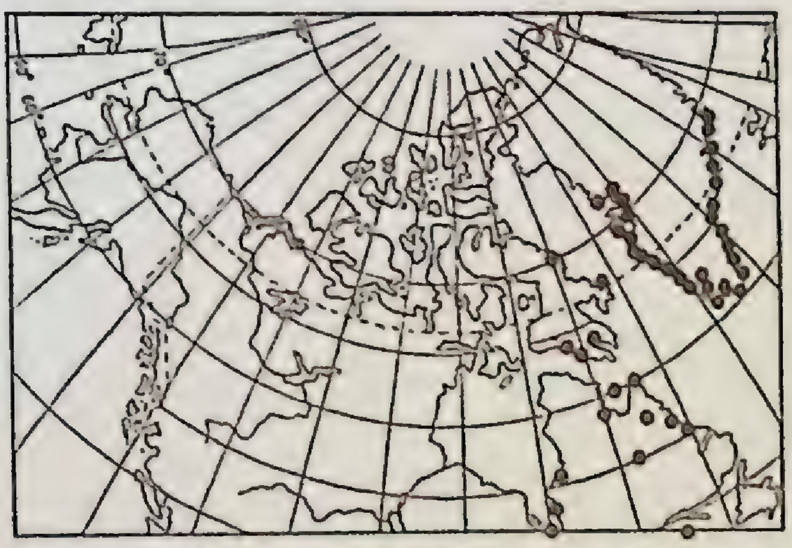
325. *Senecio congestus*



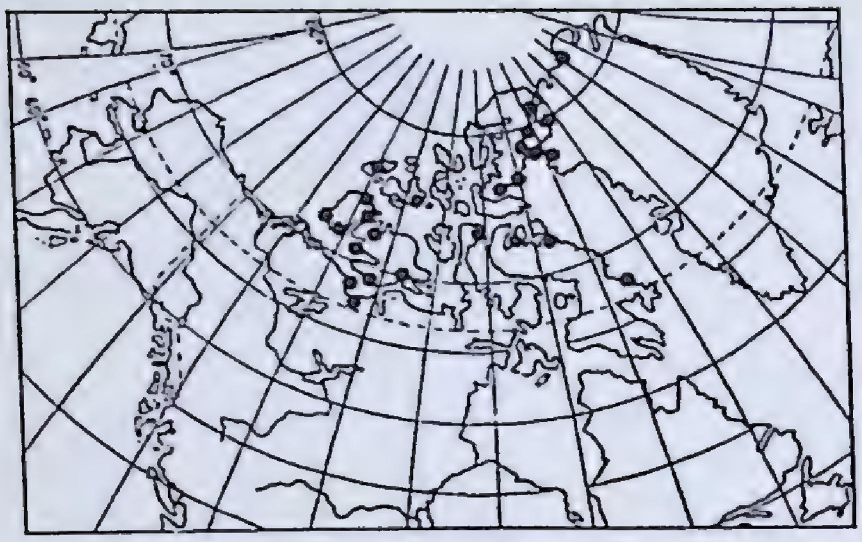
326. *Senecio hyperborealis*



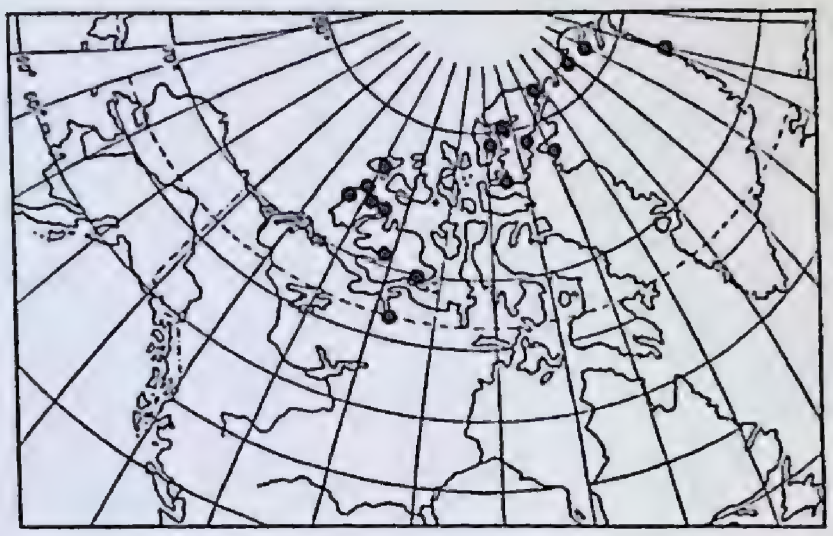
327. *Taraxacum lacerum*



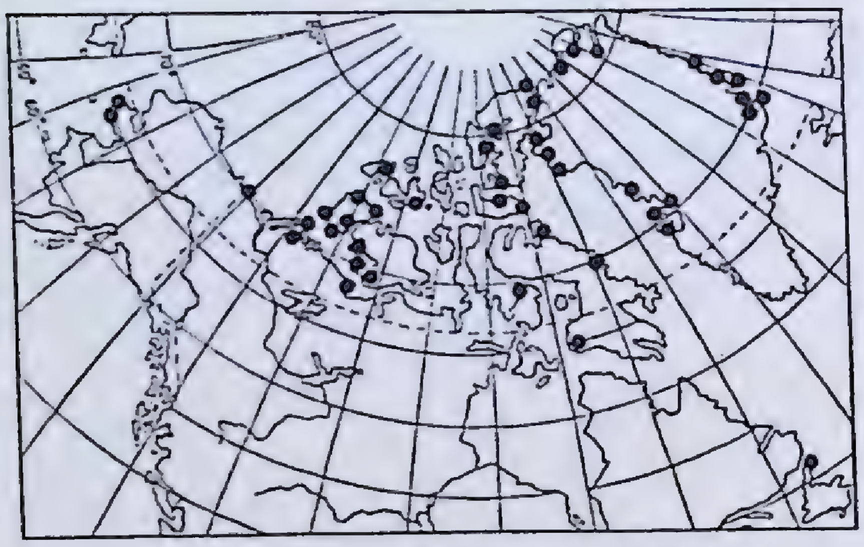
328. *Taraxacum lapponicum*



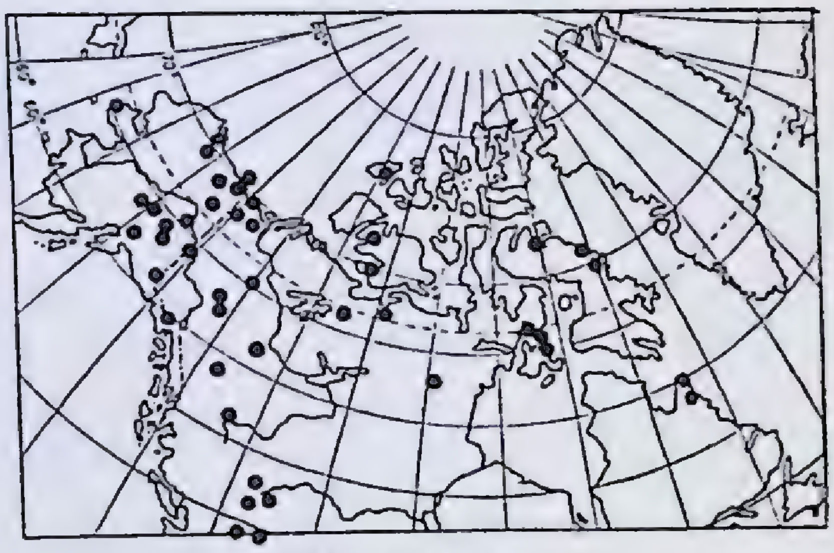
329. *Taraxacum hyparcticum*



330. *Taraxacum pumilum*



331. *Taraxacum phymatocarpum*



332. *Crepis nana*

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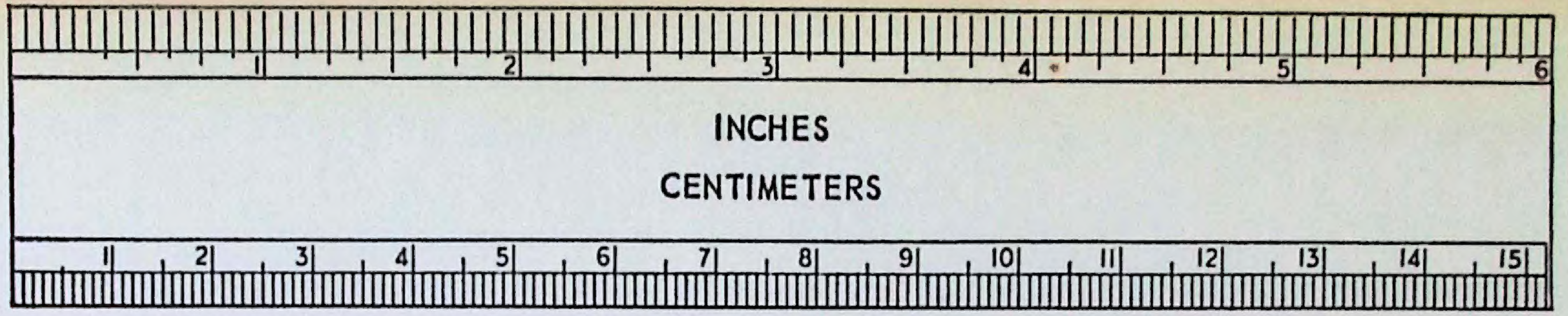
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